

THE SPORTSMAN'S HANDBOOK



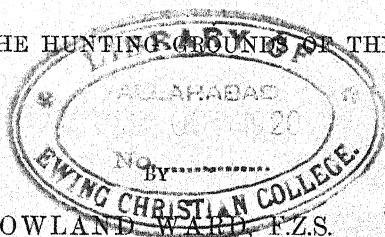
Mrs. Fanny Allen
Portland, Me.
1894

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THE
SPORTSMAN'S HANDBOOK
TO
PRACTICAL COLLECTING, PRESERVING, AND
ARTISTIC SETTING-UP
OF
TROPHIES AND SPECIMENS

TOGETHER WITH

A GUIDE TO THE HUNTING GROUNDS OF THE WORLD



ROWLAND WARD, F.Z.S.

AUTHOR OF 'RECORDS OF BIG GAME,' ETC.

EIGHTH EDITION
WITH NUMEROUS ILLUSTRATIONS

LONDON
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'THE JUNGLE,' 166 PICCADILLY
1900

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THIS BOOK IS DEDICATED TO

THE REVERED MEMORY OF

MY FATHER

The Late Henry Ward

OF LONDON

WHOSE EMINENCE AS A PRACTICAL TAXIDERMIST,

TRAVELLER, SPORTSMAN, AND NATURALIST

I PRIZE LIKE AN INHERITANCE, AND

AFFECTIONATELY EMULATE

ROWLAND WARD

PREFACE TO THE EIGHTH EDITION

IN the present edition the general text has been thoroughly revised and brought up to date. The chapter on "Hunting Fields" has, on the other hand, been entirely rewritten, and it is hoped, in its present guise, will be found more useful than ever as a guide to the sportsman.

R. W.

27th August 1900.

PREFACE TO THE FIRST EDITION

I HAVE made an endeavour, by the following pages, to present for the sportsman-naturalist some information that may be valuable to him as derived solely from *experience*—either the accumulated experience of my family, of whom I am now the only representative in our profession, or the carefully collected experience of others in those parts of the subject where my own work has not carried me. My grandfather was a practical naturalist; my father, the late Henry Ward, became eminent in the same way, but with some remarkable advantages, having travelled much in pursuit of his profession in both hemispheres, and notably as the companion of Audubon, when that distinguished man was so greatly enriching and extending the field of natural history. I have been greatly assisted by the information given me by many travellers and true sportsmen. It has been my object to avoid mere speculative opinion, and to make the book as concise as might be.

It is only in comparatively recent times that taxidermy has been elevated to claim any real art position. What has been gained for it has not been achieved by mere skill, but by extended and more accurate observation of nature in its living forms—of the behaviour and habits of animals, not simply examination of their carcasses, or what remained of those. Such observation, carefully and correctly recorded, is invaluable to the naturalist who seeks, by the preservation unimpaired of the natural features of an animal, to use the verisimilitude so obtained as an aid to art illustration. The material means for such a result are indeed important; but something more may be done with a prepared group of animals, or a single specimen, than preservation for the identification of details in anatomy or of outward appearance. Its value to the student may be preserved and increased by displaying its beauty truthfully to life, while the beauty is recognised for its own sake by even the unscientific. This is the cause I advocate, and the end I have in view.

R. W.

12th May 1880.

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THE SPORTSMAN'S HANDBOOK

INTRODUCTORY

IN starting from England or any other country on an expedition for collecting that is likely or certain to separate him from the means and conveniences that he can command for money in settled and civilised communities, it is all-important for the explorer or sportsman to provide himself carefully with everything he may want. But it is more important still that in doing so, he should be able to define what his real wants are, and restrict the satisfaction of even these with skill to the smallest proportions. He should therefore very carefully consider what he should take with him, because he cannot obtain it so well elsewhere; but it is not well to imagine possible difficulties or wants, and endeavour to provide for them particularly. In regard to most of the apparatus, simplicity is essential to real usefulness. Attention should be paid to appropriateness of dress, and experience has shown that on the field the entire dress should be of one colour, and that a dull tint. White should not be exhibited, nor even so much as a linen collar, or a pocket-handkerchief, since it is the most conspicuous colour in a jungle.

But all appointments should be always made with the recollection that in this respect a small modicum of native experience in any country is worth any amount of speculation out of it. This observation may also apply to most of the shifts and expedients of camp life. The well-recorded experiences of good sportsmen, who have been in similar fields before, are of infinite value to instruct; not for the simplicity of servile imitation in particulars, since the conditions may entirely differ, but as exemplifying the principles on which given means are applied to certain ends. Important factors in the consideration of these questions are the strength, stature, and constitution of the sportsman himself.

The progress of invention has of late years strengthened the position of the sportsman in respect of his armament, especially as regards great and dangerous game. He has wide choice of excellent weapons. In recent times this abundant facility has somewhat complicated the question, and some good sportsmen thought they recognised the obtrusion not indeed of a fresh element, but more prominence for it—the endeavour to cloak deficiency of skill by increase of mere mechanical power in dealing with great game. In reality, the conditions have not changed for the true sportsman, who seeks rather an exercise of his skill and courage than mere butchery. Indifferent ability may find compensation of a kind in the latter, but hardly the admiration of the judicious. In selecting particular weapons, each man will follow his bent; but on some points there is a consensus of opinion among good men that should strongly influence: That in the hands of a true sportsman of fine skill the chosen weapon for dangerous

game should be as light as may be in relation to his personal strength, so that his ability to wield it easily may be without doubt: The Express rifle, on account of its easy carriage and manipulation, its power for internal wounding, its accuracy and extended point-blank range, is all-sufficient for ordinary game. The weapons should be carefully suited to the sportsman's muscular power, and to his length of reach, etc. Lately a decided reaction has set in in favour of a light armament, and no doubt the example of that most accomplished and experienced sportsman, Mr. F. C. Selous, whose exploits among great game on the African fields are perhaps unequalled, has greatly influenced the idea. It is well known that Mr. Selous has long since given up the use of 4-bores and big charges for elephant and rhinoceros, and has expressed a wish that he had never used them, never undergone the labour of wielding them, or encountering their inevitable recoil, the effects of which he still regretfully feels. His accuracy of aim and knowledge of the vital spots on which to smite his game are all-important considerations for the result. Later on in this book will be given diagrams of vital spots, and it may be added that, in marking these, I was assisted by Mr. Selous's exceptional experience of result in action to check or confirm my own anatomical knowledge. Some sportsmen, indeed, while admitting fully the suitability and sufficiency of the smaller bore rifles for all soft-skinned game, dispute their sufficiency for the great Pachyderms, or even for buffalo. They miss the smashing power and the paralysing effect of the heavy bores. This view has been, and still is that of some fine sportsmen; but to what degree it may be the result of tradition, and of practi-

cal experience in conditions that are past, must be discriminated. Certain it is, that with an 8-bore Double and a .577 and .450 Express, the heaviest bags of the great Pachyderms were made a few years since in East Africa; and what is true under the conditions of that continent, is as true in the Indian jungles. Sometimes mere theory may obscure the question, and accidental practice prove the point. Mr. Selous, feeling weak after an illness, took out his lighter weapon, simply because he could wield it; and with it he killed five elephants in succession, thus demonstrating what was till then a mere speculation. The magnificent skill of this great hunter may well be taken as a modifying circumstance in any consideration of this question, and individual aptitude must govern the decision. I am convinced that the reaction against very heavy calibre arms is genuine, and though, as a result, identified with personal skill, is an increasing movement that will probably gain yet more impetus.

I value Mr. Selous's practical opinion so highly that I print his notes on rifles as given to me:—

March 1900.

“Although some fine sportsmen still prefer to use large-bore rifles and heavy charges of black powder against such ponderous game as elephants, rhinoceroses, and buffaloes, the modern small-bore rifle has now, I think, come into general use in all parts of the world as the most effective weapon against every class of game smaller than the last-named animals, with the exception of bears and the larger carnivora such as lions and tigers. It is difficult to say which is the best form of small-bore rifle, as the Mannlicher, the

Mauser, and the Lee-Metford each have their advocates, and good work has been accomplished with all of them. Success depends very much on the form of bullet used, and young sportsmen should be very careful on this point. Personally I have used a .303 bore rifle with most satisfactory results against such animals as sable and roan antelopes, and Koodoo bulls in South Africa, and wapiti bulls and mule deer in North America, and I have every faith that such a rifle would be as effective against a lion as the best form of .450 bore Express rifle, with which latter weapon I have killed several lions. Indeed, I look upon the .303 bore rifle with the best form of expanding bullet as somewhat superior killing power to a .450 Express rifle, over which, moreover, its much lower trajectory gives it a very great advantage. I am so much a believer in small-bore rifles that I fully expect to see the large-bore weapons and heavy charges of powder still clung to by some old Shikaris, entirely discarded by the coming generation of big-game hunters, who will probably find the new .450 bore rifles shooting cordite and a solid .480 grain nickel-covered projectile quite powerful enough to kill both buffaloes and elephants with body shots. I have had no personal experience with these rifles, but I have been given to understand that they shoot a cartridge which has a striking energy equal to that of an 8-bore loaded with a heavy charge of black powder. The stopping power of these .450 bore rifles may not be quite equal to that of a large-bore weapon of the old type, but the handiness of the former would somewhat counterbalance this disadvantage, whilst the superior lightness and portability of the .450 bore ammunition would be a very

material gain to a sportsman travelling far off the beaten track. Whatever my opinion may be worth I can only say that were I a young man, and about to start life as an elephant hunter once more, I would put my trust in .450 bore rifles and cordite powder, rather than the old blunderbusses and immense charges of black powder I used more than a quarter of a century ago.

F. C. SELOUS."

The difference between a .450 "Express" and a .450 *Cordite Express* lies in the fact that the former shoots a bullet varying from 270 grains to 365 grains in weight, with a muzzle velocity of about 1750 feet per second, whereas the latter rifle shoots a bullet of 480 grains with a muzzle velocity of over 2000 feet per second. The increased weight of projectile, combined with the increased velocity, makes an enormous difference in the effectiveness of these two weapons.

In this book it is not my purpose to promote discussion, but rather, in a matter of such complex consideration, to offer my own judgment, based on such experience as I possess. I am led to recommend, then, as the best armament for a sportsman among great game, reducing it to the simplest proportions: (1) a .450, .370, or .303 Double Cordite Express giving a muzzle velocity of 2000 feet per second, and shooting bullets of 480, 270, or 215 grains in weight respectively; (2) an 8-bore Double; (3) a 12-bore Double gun made with barrels heavy enough so that it can be used for shot, or with a hardened bullet for short range. A great many sportsmen of late have used, with more or less success, a large-bore gun rifled to shoot bullet or shot. I am not in favour of this for general use, as the large hole the bullet

makes is very detrimental to the value of the skin. The 8-bore, in good hands, should be all-sufficient for elephant, rhinoceros, buffalo, or gaur, which two last-named animals need heaviest striking; probably a small-bore Express rifle, in very skilful hands, would be the same; and certainly those arms are, in my judgment, suitable to all soft-skinned game. I have just been shown, by Messrs. Cogswell and Harrison of Bond Street, a new .400 magazine rifle for great game which they think equal to .577 and on. It seems a handy weapon, and weighs only 9 lbs. A Mannlicher is also a very useful weapon, but the recharging is noisy and disturbing in its action.

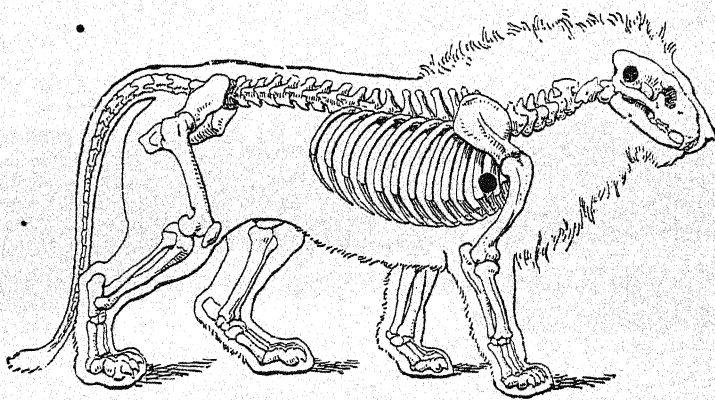
Respecting the bore .303, it should be here noted that the Government of India, on 15th July 1899, placed a prohibition on the importation of all rifles that can be used with Government service ammunition of whatever bore, namely, .303, .577/.450, or .577 bores; the prohibition also extends to ammunition for these rifles. There are, however, certain exceptions to a limited number of people. It therefore behoves the would-be purchaser to bear this order in mind, not only for India, but for other parts of the Empire, in case the order should be extended thereto.

It is manifest, then, that details have much to do with success—indeed, are almost, in such circumstances, a condition precedent of it—viz. the temper (hardness) of the bullet and the amount of the charge of powder. These points should have careful attention. Experience (our own or others') on the field is the only true guide, and experiments are only valuable according to the conditions. Although sportsmen among great game have had to use such arms as they at the time possessed—sometimes arms that seem now quite

primitive in comparison with modern weapons—the testing by sportsmen of such arms in real action is the only true test; indeed, eye and hand, as confident agents of undisturbed skilful judgment, are as important active forces for the result as the powder that utilises the best-made missile, or the most accurate bore of any index. The man who can, without erring, do all that is prescribed to clamped boards and puddled clay on an English sward, might find his calculations disturbed by the swift rush of a rogue elephant, the sudden deadly spring of a tiger, or the oncoming of a heavy buffalo, who has at last become convinced that only one course is open to him.

The sooner the sportsman realises that his operations with great game cannot be reduced to the symmetry of a game of chess, the better will he be able to guard his own safety and create success for himself on whatever field he may turn his attention. In fact, nothing in the way of arms can be of more value to him in those circumstances than quick apprehensiveness, delicate tact, strong, cool courage, and exquisite skill in the accurate use of his weapon. But beneath all this should lie a knowledge of what experience and investigation have taught us of how best to achieve our end; and one important phase of this knowledge is, *how and where it is best to strike the game in a vital part*, or in such way that the animal may be disabled. And here it must be remarked that no amount of book instruction will equal a small amount of experience; therefore it is well, when the game is *killed and comes to be cut up*, always to make a *sufficient special investigation* as to the course of your bullet in regard to its effect on the vital parts. In order to make clear

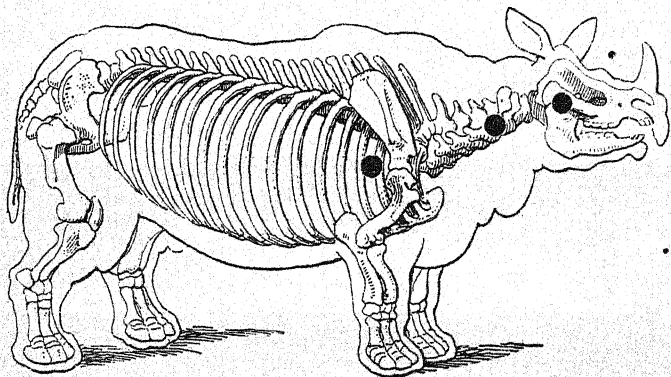
what is the position of these points, some diagrams of representative species of animals are given, on which the points are indicated. It may be said generally that the brain and the heart are the real organs to injure with deadly effect; but to these must be added the spinal column. Now with different species of animals, in various circumstances, the conditions under which these parts can be reached vary considerably. We may consider the animals in two classes: (a) those that



LION (*Felis leo*).

are dangerous, (b) those that are not seriously dangerous. These may again be divided into (c) animals that are in their natural condition unsuspicious, or quiescent; (d) animals furious, aggressive, charging. To speak first of the *Felidae*. The place to hit a lion if you are quite sure of your aim, as you may be if he is quiescent, is undoubtedly the brain. Now with tiger as well as lion, the brain is about the size of an apple, and small in comparison to the bony structure; the brain-pan being located about three or four inches

to the rear of the eye (*vide* diagram). The heart is also indicated, and when the animal is broadside on, it can be pierced by a shot behind the shoulder. When he is charging direct towards you, the best shot to deliver is a little to the right or left of the head, straight through the shoulder; by this you may perhaps pierce his heart, or possibly fracture the spinal cord; the bullet may traverse the body lengthwise with paralyzing effect, or it will—which is most important—shatter

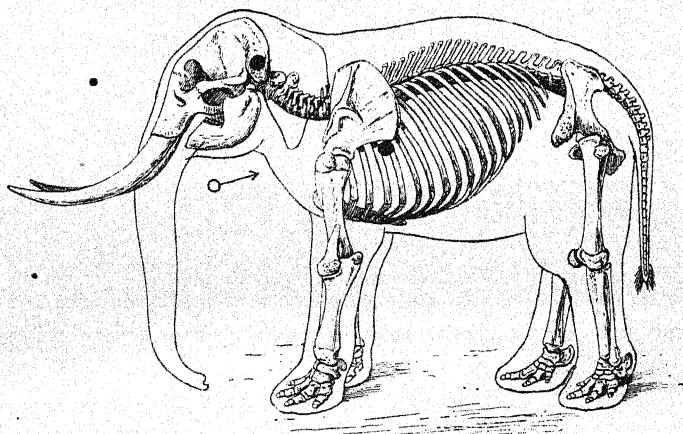


INDIAN RHINOCEROS (*Rhinoceros unicornis*).

the shoulder-bone and prevent the deadly spring. The rhinoceros is best killed by piercing the brain, or by fracture of the spinal cord. The brain is surely found in the region below the ear. The sportsman's position in regard to the animal will determine the possibility of his reaching the spinal cord. The hide of the Indian rhinoceros is harder than that of the African species, but on the living beast easily permeable; still, where there is room for choice, it is best to shoot between the folds of the neck.

In certain circumstances the charge of a Cape

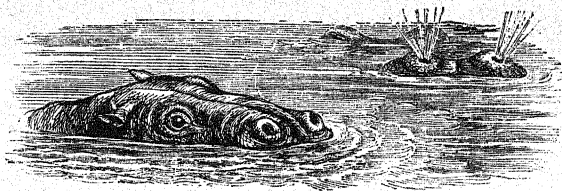
buffalo or a gaur is among the most dangerous experiences of the sportsman. The same general observations apply; but the neck and shoulder shot is to be preferred. In regard to the elephant, there is a great difference between the African and the Indian. The skull of the first is convex in frontal form, while that of the Asiatic variety is concave. The brain is wonderfully small in comparison to the bony matter by which



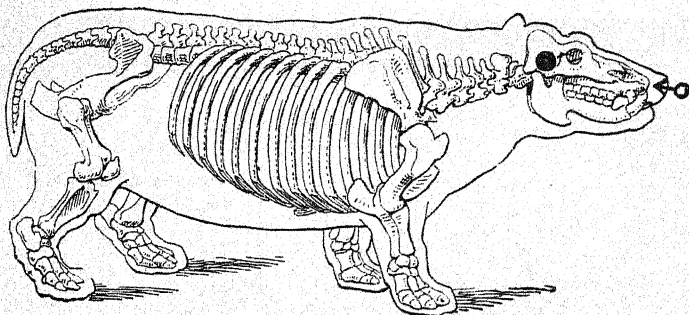
INDIAN ELEPHANT.

it is protected. The average weight of an elephant's brain is, say, nine pounds, which is but a fraction of the weight of the bone. The Asiatic elephant may easily be shot dead while charging if pierced in his forehead; but a similar shot would not be efficacious with the African. The brain of these creatures is protected by a mass of cellular bone, which cannot well be pierced by a bullet, unless it be directed through the orifice of the ear. If he be charging towards you, the best shot is in the chest. The

position of heart and brain is marked in the diagram. When an African elephant is undisturbed, his great ear will furnish a sure direction for a deadly shot. Aim at the central portion of the outer edge.



The hippopotamus, if shot when he rises to the surface of the water, should receive the bullet up his nostril; that is the surest road to his brain. When stricken the beast sinks, and it may be an hour or two before his body rises; the time depending greatly on the temperature of the water. If he is shot on the shore,



HIPPOPOTAMUS.

his heart should be aimed at behind the shoulder, half-way up his body in the line of his leg—the general rule. The seal should be shot in the brain; but the locality of his brain is very deceiving: it is

placed remarkably far back toward the neck, as shown in the drawing. The peculiar conditions under which seals are collected make extreme accuracy of aim important, for unless the brain is penetrated at first, the chances are that the creature plunges instantly from the ledge of ice or similar vantage-place on which most probably he has been resting, and, however he may have been wounded, is usually lost. Too frequently numbers of these creatures are thus wasted by unskilful hunting.



For collecting some small animals and birds, shot-guns of small gauge, throwing appropriate shot, are requisite. A useful gun for such purposes is of .410 bore, from which shot, or, on occasion, a round bullet, may be fired. Though the bore is small, it is sufficient for collecting purposes, as it inflicts a minimum of injury on those small or fragile creatures to which it is properly applicable. If the collector feels the need of a larger bore for birds on the wing, I recommend him to adopt a 20 or a 28 bore.

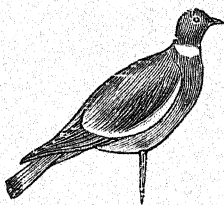
A more humble, but in its degree an equally useful implement for the collector, and one which he can employ to remarkable advantage, is the blow-pipe. Some savage races use this weapon—for it can be made by skill veritably a weapon—with astounding accuracy of aim and certainty of effect. In taking a lesson from them it is not necessary to misapply the means to any purpose for which the gun is more appropriate. But the collector will soon experience that, for many small specimens, he can use a blow-pipe with effect where he may not be able to use firearms. The implement is so simple and so easily constructed that the

price of it is inappreciable. About three feet length of any straight metal or wooden tubing, $\frac{3}{4}$ -inch diameter, through which a pellet the size of a marble may be thrown, will serve well, but an even longer tube may be chosen. The pellet should be of clay or putty, rolled in the hand to easily pass through the barrel without too much windage. It should not touch the mouth, but be lightly placed just in the orifice, by stopping which with the thumb the tube can be conveniently carried loaded, muzzle up, ready for the most rapid use. To propel the pellet, the puff must be sudden and powerful. There is a proper way of effecting this. When a novice first begins to use the blow-pipe, it is a common error to eject the breath only direct from the lungs; he should acquire the habit of inflating the cheeks, so as to make a storage of wind, as it were, for each shot; that, added to the breath from the lungs, gives a force that will sometimes astonish. The hand follows the eye in aim, and practice will often develop unthought-of proficiency. The particular advantages of the blow-pipe are these: that its operation is silent and does not disturb, it is effective for small and moderate-sized birds not on the wing, it is easily manipulated in a wood, it is obtainable anywhere, and the ammunition costs nothing.

The question of traps, snares, etc., is one which concerns the collector or trader rather than the sportsman. Many specimens can of course be collected by these means. A man's own taste will guide him in the adoption of them better than any precept or instruction. There are many ingenious devices used in America, Scandinavia, and other countries for the capture of game of all sizes, or rather the destruction of them. It will

be found, however, that the ordinary gin, of whatever size it may be made, remains the really most efficacious of all such contrivances. Implements, made on this principle, are now constructed of great power and large dimensions for the trapping of bears and other great game. In North America they can be easily applied with a certain success. But in Africa they do not work with such definite results in regard to selected game. There, round every camp or centre that has attractions for wild animal life, in overwhelming proportion to the superior animals that may be sought for, come the scavenging hyænas and other worthless lower creatures, and the chance is that they fill the carefully set gin before it can close on the game for which it was intended. If circumstances sometimes sanction the employment of such means, they are generally abhorrent to the true sportsman.

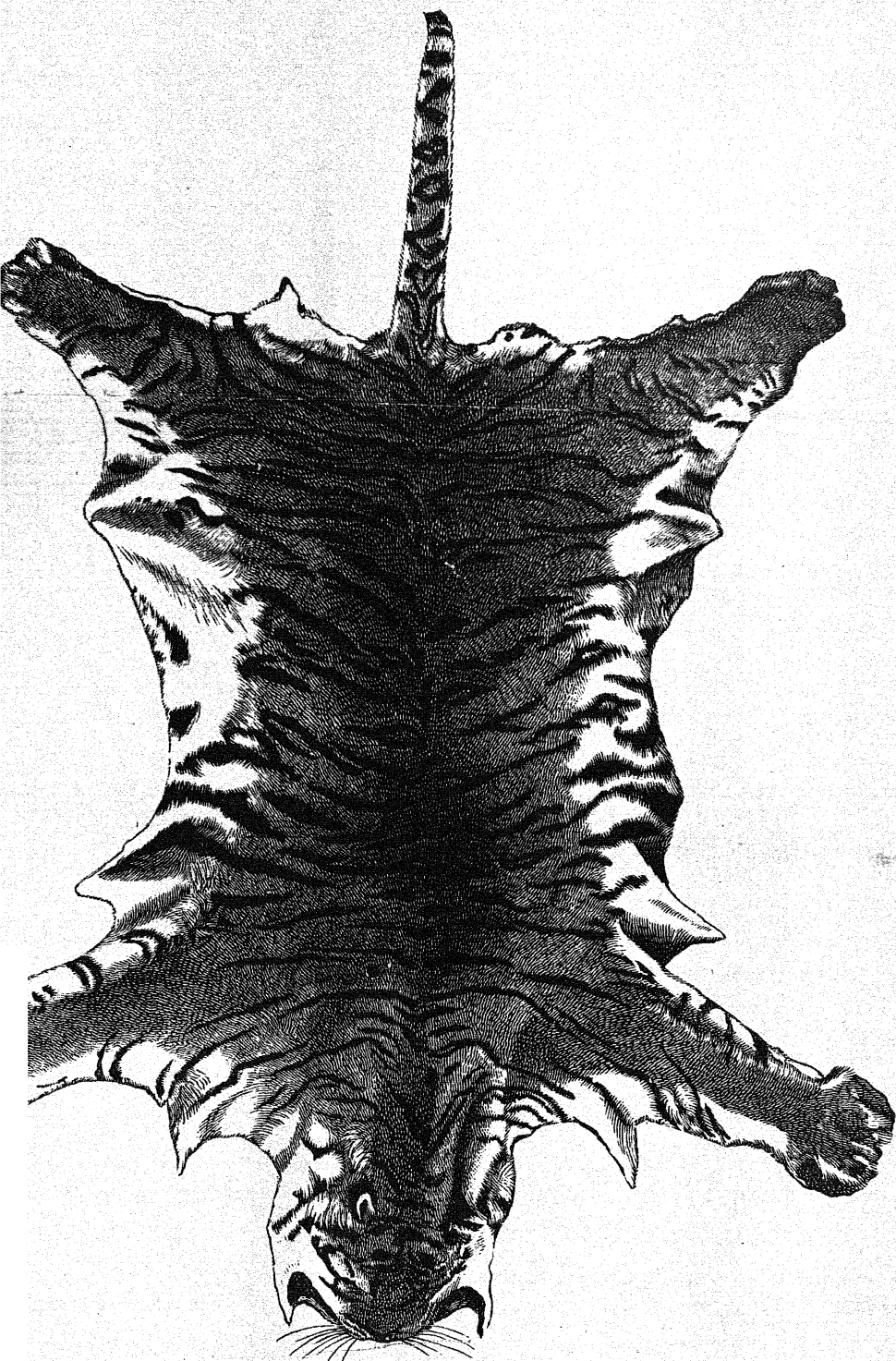
The employment of dummies and decoys for birds, and especially for shore-birds, is interesting and useful. Probably in all parts of the world ingenuity can adapt this resource in degree. As a rule gregarious birds are those most subject to the fascination, for such it is. To give examples in our own country—wood-pigeons may be thus attracted. Any carpenter can make the shape of a wood-pigeon in the rough; no legs need be shaped, but a stick should project from the lower part of the breast, so that the dummy can be fixed in the ground, or placed in a tree, as may be required. This figure must be painted in colour to represent the pigeon, and the paint must be “flatted,” that is, not glossy. Such a dummy costs only



a few shillings; or in place of this, a board cut out to represent head, tail, etc., and body made up of wood, wool, will answer the purpose. They can be painted after being dressed with carboline. It is astonishing how the wild birds will come down to their haunts when they see this dummy there to assure them. In like manner plovers, gulls, and similar shore-birds may be decoyed. The decoy-duck is well known, and made buoyant to rest on the water. Verisimilitude in regard to action is a great gain sometimes with these last-named, and is more important than mere details of feather.

A useful part of the sportsman's kit is a photographic camera. An animal may be photographed with its surroundings, just as it fell; the picture may be made a nucleus of interesting and instructive memoranda, of obvious value because such details are too often forgotten, or the impression made by them effaced, just in proportion as we move from the spot. Photographic pictures of living *feræ naturæ*, in their native jungle or forest, have indeed been thus taken, and hundreds of sea-birds on the wing wheeling over an Indian headland have been reproduced with such accurate representation of the individual birds, that when enlarged the picture presents the perfect specimen for our contemplation—our more leisurely examination in fact. Very important in this connection are the films which can be taken in the camera on a continuous roll, of say twenty-four exposures, passing for operation from the roller that holds the blank film-paper to the roller that stores the same after it has received the negatives, to wait convenient development; or flat films can be used in place of glass plates in an ordinary camera for weight saving.

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SHOT BY H.H. THE MAHARAJAH OF COOCH BEHAR.
(Length before skinning, 10 ft. 1½ in. ; dried, 11 ft. 7 in.)

[To face page 17.]

The knives or other implements should be as few and simple as is consistent with meeting the real need efficiently; a tiger can be perfectly skinned by a skilful hand with a shoemaker's knife, costing only a few pence. It is highly important that some preparation should be made for efficient and accurate record of scientific data, concerning natural features that are evanescent, such as the colour of the eye, of a bird's bill and legs, etc.; but it is not too much to say that the whole of such apparatus may, by well-considered ingenuity, be carried in the compass of a case whose capacity is measured in a few inches. It must be borne in mind before all things, that the value of any object secured and preserved depends on the completeness with which all its natural features are saved, as well as the condition in which the specimens are kept. This is true in degree for whatever purpose the object be designed, but it is essential in regard to specimens for the illustration of natural history.

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EAST LANSING, MICHIGAN

The knives or other implements should be as few and simple as is consistent with meeting the real need efficiently; a tiger can be perfectly skinned by a skilful hand with a shoemaker's knife, costing only a few pence. It is highly important that some preparation should be made for efficient and accurate record of scientific data, concerning natural features that are evanescent, such as the colour of the eye, of a bird's bill and legs, etc.; but it is not too much to say that the whole of such apparatus may, by well-considered ingenuity, be carried in the compass of a case whose capacity is measured in a few inches. It must be borne in mind before all things, that the value of any object secured and preserved depends on the completeness with which all its natural features are saved, as well as the condition in which the specimens are kept. This is true in degree for whatever purpose the object be designed, but it is essential in regard to specimens for the illustration of natural history.

GENERAL HINTS FOR THE COLLECTOR

DIRECTLY a specimen is secured, inspect the eye, and make a concise memorandum of its colour and any peculiarity of its appearance. A note should also be taken of the colour on the bills, legs, etc., of birds (the brilliancy of which may fade), and particular mention should be preserved of eyelids, and, if they have any, their colour. The same may be said of wattles and all such features of naked skin, because most frequently when these parts dry, the colours not only fade, but sometimes change absolutely; and the taxidermist at home may be led to a wrong conclusion. Never omit and never defer the making of these memoranda.

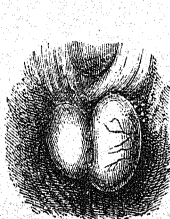
It is better that specimens of all warm-blooded creatures should be cold before they are operated on.

In dealing with birds care should be taken, directly they are shot, that the plumage be not broken, or injured by putting many of them together in a bag; and that the blood from one fresh specimen should not injure another. Instantly plug up with cotton-wool the throat, nostrils, and all shot-holes. Rare examples can be isolated in a cone of paper, or otherwise, as soon as secured. It is often a scientific gain to save at least the *sternum* or breastbone, with the *coracoids*, the

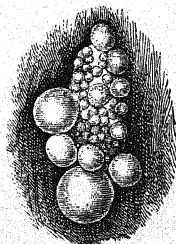
furculum (merry-thought), and *scapulae* of birds, and the skull when the skin is not preserved.

Pay particular and unvarying attention to the labelling of specimens.

Labels of convenient, durable material should be provided. Note thereon:—Date; a number; where killed; native name; scientific names; sex; locality; habits observed; colour of the eye, etc.; and any other peculiarities of colour. To sex a bird, examine the



MALE.



FEMALE.

inner regions of the loins, and if male mark it ♂, and if female ♀.

This question of ticketing, and the preparation of the label, is all-important. There is little if any doubt that the brilliant colours on a fresh, healthy specimen, at the moment it falls, are always deteriorated, sometimes totally altered, under treatment by any preservative. Therefore, when the "colours" are noted, if possible, the collector should always put on his label a blot of water-colour pigment to reproduce, as near as may be, the brightness and quality of the tint. This may need some ingenuity, but will be found not difficult; a few cakes of water-colour and a brush take little space; and the gain by this record will be great. The sexing is of much consequence; to determine it,

where necessary, involves a slight dissection, when the appearances will be found as on page 19.

Labels corresponding to those on the skins, etc., should be attached firmly to skulls, horns, bones, etc., so that exact identification may be easy and certain. But, in addition to such labels, skins should always be marked for absolute identification (ownership) in the manner following: With a proper awl puncture the owner's initials from the inside of the



skin to the hair. Do this near the root of the tail on the hind-quarters, etc., and right through. The mark is indestructible, even if it seem to close up, and always becomes visible on cleaning the pelt. When a head is saved, make them on the scalp, or say on the neck, but always in one position; and for all future time you have an indestructible means of recognition, if need be. This is a method of marking usual among skin-merchants, and it may well be more widely applied.

For similar reasons, the horns of animals that are intended for ultimate decoration of walls may be marked with initials in ink or pigment on the side that will not be presented to the spectator when they are in place.

But they should also be labelled; zinc labels wired on are the best. I call particular attention to this, not only for the obvious scientific value of it, but because much confusion of ownership often occurs when a party of men shoot together; the distinctive marks or dimensions of specimens are mostly so slight, yet so important as to value, that the best endeavours to adjust matters, at the end of a campaign, often end unsatisfactorily.

Be as careful as possible in all operations; and especially that no blood or grease, or juices from the offal, injure the feathers or fur.

It is generally far better to attend to the preserving of your own specimens, than to trust to native agents or servants; if you are compelled to trust to them at all, never sanction the use of lime in the materials they employ, even as a small constituent. Some natural substances (berries, etc.), used by natives, will change the colour of specimens; the yellow ground of a leopard skin may be thus changed to reddish brown, etc.

METHODS OF PRESERVATION

IN regard to the preservation for after treatment, of the skins of great game, it would be easy to quote many recipes of approved efficiency, and, in given circumstances, not open to doubt. But, for the particular conditions of the explorer, the *simplest* process that is safe and good is the *best*. I think that the materials carried may generally be reduced to two, viz. a quantity of dry powdered alum and a supply of spirits of turpentine. How these should be applied I shall presently explain.

There are two methods of preserving animals, or the skins of animals, on the spot where they are collected till they can be transmitted for definite treatment by skilled practitioners at home: viz. (1) by means of preservative applications, so that natural decay and the ravages of insects, etc., may be prevented; (2) by immersion and packing of specimens, on proper principles, in spirit, pickle, etc. Convenience and obvious desirability will rule the adoption of either plan, and its application to particular specimens. Animals taken whole can be dissected; and examples of absolutely new species, or specimens of rare occurrence, may, at discretion, be thus transmitted with many advantages. Generally pickle, or brine,

preserves natural colours of specimens better than spirit.

And now in regard to the preservative applications. Since the first edition of this book, there has arisen a strong reaction against the use of preservatives containing arsenic, which are consequently highly poisonous. For trophies and objects that are not protected by glass, it has long been my practice to use a non-injurious compound of my own invention, so that such danger as might be feared, under these conditions, from the use of arsenical paste might be avoided. I have now decided on its exclusive use, and its superiority in all cases having been proved, all trophies, great and small, in my studios are treated with it. Having ceased to employ or supply arsenical paste, I join my voice in deprecating the needless risk incurred by the use of poisonous preparations. There are conditions under which both means fail in the hands of disputants as to the value of either resource. No preservative is efficacious against incompetence in its application, or preventive of the effects of simple neglect. Specimens of natural objects require occasional care for their permanent preservation. If an owner hangs up a collection of horned heads, and leaves them without any attention for many years, he must not be surprised to find the ordinary agencies of decay work ruin on his specimens. His housekeeper would not treat her blankets or curtains so, but would by timely attention keep them safely so long as they are to last. In like manner the mere brushing-up, and redressing with "Insect Death" or turpentine, of natural history specimens will retard or prevent their decay.

TAXIDERMINE, as I have named my perfectly effica-

cious preservative preparation, is made in (a) paste, and in (b) powder, and is of easy application, and not dangerous to the operator in any way. For Pachyderms and great game the powder form is used dry. It should be completely applied to the pelt, and rubbed carefully into irregularities and folds so that the whole surface be dressed. This is No. 2 Taxidermine. A similar powder, No. 3, is specially for birds; and there is Taxidermine No. 1, in paste. This last-named is suitable for small mammals and birds, and the more delicate skins, even the most tender. To these the paste should be applied first on the inner side, and afterwards, where requisite, the dry powder (No. 3) which is designed more particularly for birds. For the smaller specimens, the Taxidermine No. 1 should be slightly diluted and applied with a hog's-hair brush; but the powders Nos. 2 and 3 must not be treated thus.

PRESERVATIVES IN THE FIELD.—The skins of all mammals, fish, and reptiles may be effectually preserved for transmission home, by the simple dry alum process; but those of birds should be treated with Taxidermine. These resources, simple as they are, will be found sufficient, and they have this distinct advantage, that in the ultimate treatment of the specimen for permanent keeping, there are fewer difficulties to be surmounted by the skilled naturalist or the curer of skins. When salt, for instance, is used, or the lime of native Indian dressers (the most destructive in the world), or the vegetable curing of the Australian skins, there is often more trouble to take *out* of the pelt the deleterious substance, so that the process of decay may be stopped, than the specimen is worth. The skins of birds must not be treated with alum, or they become fatally brittle; the Taxidermine has a contrary effect,

and softens the skin. All specimens or examples of either group must be protected from the ravages of insects; and for this the simplest means is the copious and judicious application of spirit of turpentine; but this must not be applied to birds, because it dissolves the grease that is found more or less in every bird-skin, and thus the metallic colours of plumage become permanently robbed of their brilliancy, and birds of white plumage are soiled by a yellowish stain. Where, however, there are no metallic colours to be preserved, the advantage of turpentine as a preservative may be gained, if it be applied lightly and with skill to the surface of the feathers, and not poured over the skin, as we might do with the skin of a mammal. The best way is to apply it with a saturated pad of cotton-wool. Of late years I have received many specimens, principally from Africa and India, packed with naphthaline crystals, which appear to be a protection against damage by insects during transit. But in this connection, the powder called "Insect Death" must be mentioned, as its usefulness to the naturalist-traveller cannot be overrated. It is an inodorous and efficacious powder not destructive of anything but insect life, and can be shaken from a specimen in a moment. Bird-skins when properly saved may be amply dusted with this on the feathers with every confidence, and it does not add the odour of turpentine. If white birds are thus treated, be very careful that the specimens are kept from damp (as indeed all such skins ought always to be), or there may be liability to stain. "Insect Death" is very valuable to the naturalist who stores specimens for keeping or transport. In fact, it is a pleasant and cleanly protection for fur and feathers, and to that end

should be kept and judiciously applied. After an experience of many years, I have never found an insect on a specimen dressed with this powder; and if properly applied, it should keep any specimen free from insects. It is more particularly efficacious against moth.

ALUM PROCESS.—The material to be employed is powdered burnt alum, unless Taxidermine No. 2 can be obtained. When the skin of a mammal has been removed, the first thing to do, without loss of time, is to "flesh it," which means to carefully clean the pelt of all superfluous flesh or fat. This having been done, spread the skin hair downwards and peg it out flat, unless you have a frame or other better mechanical means of stretching it. The state of the weather is a consideration in this work. During the rains in India the air is charged with moisture, and it is difficult to dry anything by simple exposure. At such time, in any country, a skin pegged out would probably be spoilt, and the hair slip: then it is more advisable to use "pickle," described on p. 29. In hot weather pegging is easy enough. It should be managed neatly, so as not to injure the skin by tearing large holes. It is a good plan, when available, to get a few dozen long iron nails made with a bent loop at top for conveniently stringing them together when not in use; they cost very little anywhere, and are neater in use than wooden pegs. In the case of small animals in some portions of which the bone is retained—for instance the leg—the skin must not be pegged out; and indeed where means exist of avoiding it, do not "peg out" at all, as the skin is always somewhat injured by that process, and sometimes is irreparably torn, therefore avoid such injuries if you can. The act of drying

induces shrinkage; so arrange your skin that as it shrinks it cannot wrinkle into folds, for in those, if anywhere, the ravages of insects will lie. In cold climates, perhaps, pegging and stretching may be avoided altogether. The skin having been spread out flat with the pelt uppermost, proceed to rub in the alum or Taxidermine. This should be done with the hand carefully so as to cover every portion, and the supply of preservative should not be stinted. It must be particularly applied to the lips, ears, feet, and other fleshy parts that have been prepared in skinning to receive it (see p. 42). The whole pelt having been treated thus by hand, sprinkle it with the powder till it is regularly and well covered. The skin should be left in this state until quite dry, and it will be found that the astringent applied will dry it with rapidity. But during this time it is most necessary to watch it well, so that if there appear a tendency in any part of it to "taint," which would cause the hair to "slip" or come off, the preservative should be instantly applied on the hair-side as well as the pelt wherever requisite.

TURPENTINE.—When the skin is dry it must be conveniently folded, hair-side inwards, for packing, that is if it be of large game and requires folding. First turn the hair-side up and pour turpentine freely over it till the skin is thoroughly anointed. Note that with long-haired animals the turpentine reaches the roots of the hair; sprinkle the pelt side, although it is not necessary to anoint that so fully as the fur. It is well, when convenient, to put some dry material in the folds to prevent contact between the inside of the skin and the fur; and, as occasion may serve, the skin should be unfolded and inspected, and more turpentine or preservative applied to parts if necessary. In

the process just described the astringent powder is applied to preserve the skin, and the turpentine to protect it against insects. The ravages of these latter pests in a hot climate, such as India and Africa, are indescribably vexatious, and should be carefully guarded against. The principal of all the marauders is a beetle about a quarter of an inch long, of a dark dirty colour, with a transverse band of dull yellow; it does not often fly, being generally more busily engaged on carefully collected skins, but it can do so. Its common name is



"The Bacon Beetle"; or scientifically *Dermestes lardarius*; but being such a veritable enemy it is best not to rely on its cognomen, but on instant

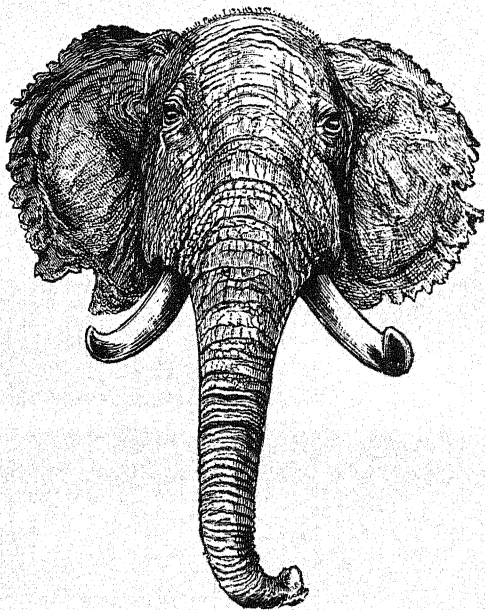
recognition for immediate extermination, therefore its life-size portrait is given on this page. Now this insect does not like any spirit, and the one spirit it really dreads as fatal to its constitution is turpentine. In the colder climates benzine and similar spirits are sometimes used, and with efficacy, but these evaporate more rapidly in warmer temperature, and turpentine, if only because of its less rapid evaporation, is at all times to be preferred. *I have sometimes unpacked trophies to discover the hair entirely removed from the pelt by the exertions of the Dermestes; and in like manner I have received skulls in London that have been imperfectly cleaned of flesh, from which I have shaken hundreds upon hundreds of fattened lively specimens. I gave them the turpentine they should have had when the specimens were packed.* Not only skins, but all skulls and horns should be saturated with turpentine before they are shipped to England. Sometimes the insects will recover activity after the milder influence of benzine. The process described above is quite

sufficient for Pachyderms. All skins should be well looked after at night, as during the darkness, animals of various kinds, including half-starved village dogs, frequently lurk about a camp, and nothing comes amiss to their hungry maws.

PICKLE.—Another process that is frequently most convenient on shipboard, or according to the conditions, is that of "pickling." The skin having been removed from the carcass and cleaned, instead of being laid out for drying, should be thickly covered over the flesh side with powdered alum, the lips, eyelids, feet, etc., being particularly treated; then it should be folded in a convenient form, and thus be immersed in a barrel of brine, or what is technically called "liquor"—in fact, a mixture of alum and salt dissolved in water, in the proportion of 6 lbs. of alum and 3 lbs. of salt—sea-salt if possible. Dissolve both in a small quantity of hot water sufficient to make a gallon, and let the liquid cool before the specimen is immersed. The skin must be sweet and fresh at the time of placing it in pickle, or the operation will not succeed. The vessel must be kept closed. A number of skins may be placed in the same barrel, which is then ready, when quite filled, and closed, for storing or transit. If thought more convenient to make the package lighter for travelling, the skins, when they have been thoroughly pickled for a few days, may be taken out, spread open and dried, then repacked. This, however, is an operation obviously requiring great judgment, as if it be imperfectly carried out the consequence may be ruinous.

A conspicuous exemplification of the advantages in this process of brine-pickling was afforded by the great elephant-trophy brought from South Africa by

the late Duke of Edinburgh. In this case the system was adopted in manner following. The entire skin of the mighty beast was preserved. The animal was undoubtedly one of the largest examples ever brought to this country of the African species. His



AFRICAN ELEPHANT HEAD.

height at the withers was 10 ft.; from tip of trunk to tip of tail, 23 ft. 5 in.; girth, 16 ft. 6 in.; from top of head to end of trunk, 11 ft. 3 in.; circumference of head, 10 ft.; from ear to ear, 9 ft.; length of ear, 4 ft. 6 in. The skull and tusks weighed more than 3 cwt.; the skin of the head when taken from pickle weighed 3 cwt. 6 lbs. The weight of the whole skin when taken

from pickle was 20 cwt. 7 lbs. The weight of the entire elephant in the flesh was 4 tons 8 cwt. 4 lbs. On the field the skin, having been duly prepared, was folded in this wise: the flanks with skin of legs and feet were folded inwards, each half-way, so that the inner surfaces or flesh-side were outwards; then the skin of the head was in like manner turned back, the trunk being disposed of longitudinally down the centre between the edges of the flanks; and the tail-end with the nether extremities was similarly folded back to meet the trunk. The whole skin was then rolled as tightly as possible round the head, and carefully tied at both ends of the bale. In this condition it was placed in a great barrel, which was then completely filled with liquor, and properly coopered for transmission to this country. On arrival in London, when the head of the barrel was removed, the perfect success of this mode of transport was at once apparent. There was no unpleasant odour. On taking out the mass and unfolding the skin, it was noticeable that every part of the surfaces had been properly acted on, and there was not a single tainted fold. At that time it had been upwards of a year in the barrel. The old pickle was removed, the skin was re-folded and restored to the barrel with a supply of fresh liquor, and the cask was re-coopered. In this manner the skin was preserved for upwards of three years more, until the decision was arrived at how this great trophy should be treated. The magnificent head was modelled and mounted in the Ward studios, and is now in Clarence House; the feet (which supply an index of his size) were utilised for ornamental purposes, while the hide was cut up and converted to use; a considerable portion being made into walking-sticks, that formed appropriate mementoes.

The skulls of large mammalia are always removed from the skins. It is important for the proper preservation of the skulls of *Felidae*, that they should be protected from injury to, or loss of, the teeth. This is best done as follows. When the skull has been boiled (not too much or it loosens the sutures) or soaked, and properly cleaned, and the teeth coated with grease about half an inch thick, it should be tied up in a calico bag and placed in a separate compartment of the packing-case designed for it. Stuffing should moreover be put into each compartment to prevent the specimen from being shaken, and so injured. The wash for teeth mentioned above may be made of wax. As the tooth dries it often splits, the bony structure as well as the enamel; wax or grease tends to prevent this action.

When time and circumstances permit, there is another method of cleaning large skulls that may be useful. Tie a rope round the horns or antlers to secure them to the edge, and cast the skull into a stream or tank. When the horns (which have bearers) become loose they can be removed and cleaned, the skull being left in the water until the flesh decomposes, when it can easily be scraped away. Ordinarily, however, it will be found that numberless small fish will be at work on it night and day, and will clear it of all extraneous matter if they are allowed time enough.

Another method is to bury the skulls or bones after the flesh has been removed in wet sea-sand. Mind the horns are not buried, only the bones or skull. By either of these means much trouble will be saved, and the risk of insects ruining the collection lessened.

It should be mentioned, in case of need, that many strong mineral and vegetable astringents besides Taxi-

dermine, alum, or salt, can be used as preservatives with more or less success, such as saltpetre, powdered green vitriol, or sulphate of iron, boracic acid, etc.

THE CARBOLIC ACID PROCESS.—Calvert's No. 5, diluted with 150 parts of water to 1 part carbolic, is a very useful preservative for big game, provided it is well stirred before the specimen is put in. I have kept fresh-skinned specimens in this way for several years, and it is used very largely in our studios. It is advisable to constantly test the strength of the solution if kept in use, as each specimen immersed weakens its preservative properties.

A METHOD OF TEMPORARILY SAVING BIRDS.—When the specimen cannot be skinned directly, but the process has to be delayed, cut the bird, say, under the wing, then open its mouth and immerse the specimen in the Carbolic solution to permeate it well. This will keep it safely till it can be skinned properly. Granulated Carbolic mixed to a proper strength is efficacious and much more portable.

THE WOOD-ASH PROCESS.—A large skin, in default of anything better, may be plentifully dressed on the inside with wood-ashes, taken cold from the camp fire. The virtue of wood-ashes really consists in their detergent properties; for, containing as they do a large proportion of potash, the fat is thereby converted into soap, and sometimes in this condition is immediately brought away by the hand, or the scraper. And as a preservative, excepting under difficult conditions, the effect is cleanly and good. Remember that there is a difference in ashes, depending on the wood employed. Oak is one of the best. Of vegetable substances, gumkino, oak-bark, willow-bark, catechu, powdered nutgalls, or any such material rich in tannin, are available; and

strong spices, or strong tobacco powdered, will keep off insects.

FORMALIN.—Although this is rather an unsatisfactory preservative, a solution of it will frequently save specimens. The drawback from the Taxidermist's point of view is that the specimens are practically useless for mounting, as it takes all the stretch out of the skin. I have tried it on specimens in a hot country and have made experiments extending over four years, but at present mounted Formalin specimens are not to be compared with those saved by other methods. Bait for fishing is saved with a solution of 20 to 1. To any one desirous of experimenting I would suggest a small bird freshly killed being put in a solution of 300 to 1 in an uncorked bottle or jar. Some specimens immersed in this solution absorb the Formalin much quicker than others. If the skin in a month is tough or brittle when dry, it is, in my opinion, useless for mounting. Care must be taken not to get Formalin on your hands, as, like Carbolic, it acts very quickly. If the specimens, such as Molluscs, etc., are to be kept permanently in Formalin and not wanted for mounting, it will be found economical and useful. As a preservative for marine animals, its great bactericidal qualities prove it to be a powerful antiseptic. Formalin is said to contain 40 per cent of formic aldehyde. A solution of from 3 to 5 per cent is a very useful one, but I would warn operators that specimens preserved in this manner are of little if any use. I should be glad to hear the result of any experiments in other parts of the world.

FISH.—The proper preservation of fish is undoubtedly a matter of some difficulty. Naturalists are perhaps not generally aware how few examples

of foreign fish reach this country in a condition that admits of effective treatment, or how special a branch of the art it is to set them up effectively and well. The common processes are: (1) to plunge and bottle them in spirits; but we all know the effect of that on the evanescent colouring, as well as on the natural contour of the specimens; (2) when they are skinned (see p. 69), to apply dry powder preservative—in default of Taxidermine No. 2, powdered alum—to those parts where the flesh cannot be perfectly removed, so that it may be dried, and to apply Taxidermine paste on the inside, for preservation of the skin.

REPTILES.—The skins of crocodiles, alligators, and other large reptiles having been removed (see p. 72), must be manipulated as follows. Clean them of all flesh as perfectly as you can; this, however, cannot be done very completely about the head or the feet of a large example, and to those parts Taxidermine, or even alum powder, must be applied in plenty to dry up the flesh as much as possible. The roof of the mouth should be cleaned, and the tongue must come away. With smaller specimens that can be skinned over the skull to the lips, a similar application must be made where it seems necessary. To the inner part of the skins some Taxidermine No. 1, or wood-ashes, may be applied; but the preservatives are not nearly so necessary as in the case of warm-blooded mammals. Indeed turpentine to preserve them from insects will afford nearly all the protection they need. The skin may be rolled or folded for transmission. With snakes, the skin dried flat should be rolled from the tail like a ribbon, the belly side inwards on account of the scales (see p. 71). Small specimens of any species will go

in spirits. Carbolic is a useful agent in cleansing reptiles.

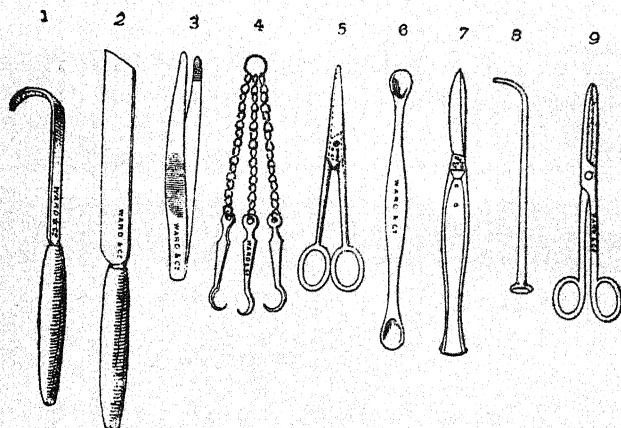
IMMERSION IN SPIRIT.—Something must be specially said about this mode of preservation, for there is absolute necessity that it should be *properly* carried out, or nearly all the advantage of the resource is neutralised. Either fish or reptiles, or even birds, that may be sent home in spirits, should be treated in this way. First provide a tub, or other convenient vessel, full of the spirit, wherein the specimens can be put as a preliminary measure, so that the mucus, water, etc., may be drawn out of them. Before placing them in this a moderate incision should be made, with as little disturbance as possible, in the belly, so that the spirit may permeate all parts. Keep the specimens in this spirit from a week to ten days, then transfer them to fresh spirit, and let them remain there for about two weeks more, before final removal to the vessel or vessels of spirit in which they are to be packed for the remainder of the journey. Reptiles, being less watery than fish, generally require only one change. The first tub of spirit may be used for more than one set of animals, but will of course decrease in strength by the addition of the water drawn from them; the second spirit should be stronger; the third quite strong enough to be readily inflammable. The specimen will then be safe for more than six months, and may be sent home. Proof-spirit, diluted about one-half with water, is perhaps the best to use, but rum or gin serves well. The specimens may be packed for transmission in great numbers in the following manner:—Wrap each fish or reptile in a piece of linen or cotton rag, and arrange them to rest closely in an appropriate vessel that can be then filled completely with spirit.

A wooden packing-case, well lined with tin, that can be hermetically soldered up when quite full of the liquid, serves well. Of insects, beetles can be transmitted in spirit. The native spirit "daru," called by Europeans "native liquor," and sold in all the bazaars in India, will do very well instead of rum, etc., for preserving reptiles. It is very cheap. Besides the above, or when they are not attainable, benzoline may be used, but requires judgment.

INSECTS.—The majority of insects having been properly stored as directed (see p. 72), require little more than a supply of camphor, naphthaline, or cyanide of potassium, to protect them from decay. Mites sometimes appear in them as an evidence of taint, and the best means for destroying the intruders is benzoline. But some very large moths, butterflies, and beetles require a different treatment. In such cases the body must be opened by a longitudinal slit on the side not intended to be displayed, and as much matter removed as can be got away without impairing the specimen. The cavity thus created should be completely dusted with Taxidermine No. 3, and the incision neatly and skilfully closed over it; a small but sufficient piece of cotton-wool being introduced to preserve the shape.

SKINNING AND PREPARATION

THE apparatus necessary for the skinning of animals is really very simple, and I strongly advise that it should be kept to the lowest proportions. It is the



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|--------------------|-----------------|
| 1. Skin scraper. | 6. Brain scoop. |
| 2. Skinning knife. | 7. Scalpel. |
| 3. Forceps. | 8. Blowpipe. |
| 4. Chain hooks. | 9. Tow pliers. |
| 5. Scissors. | |

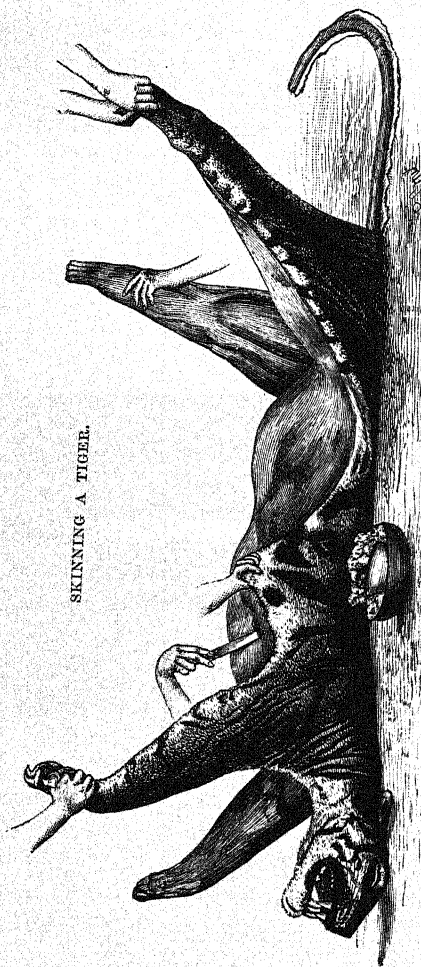
skill with which the knife is wielded that is more important than the best of knives. A shoemaker's knife, a small saw, a pair of pliers, and perhaps a pair of cutting pincers, are all that are required for operating

on the most important game. Some small implements for the lesser specimens being added, this is all the kit that need be carried. To understand the principle of the thing, and to adapt that principle in practice with ingenuity and judgment to the particular conditions that present themselves, is the true learning; and to cumber the mind with numberless minute memoranda of other travellers' experiences in emergencies that may never be our lot, is a useless task. Enrich the recollection with all that experience brings to bear on the subject in deductions, to illustrate or to inform, but not to copy simply of necessity. The best operator is he who does what is right to carry out his purpose, carefully, on true principles, according to the means at his command, and the advantages of surrounding conditions; he who simply copies what others have done in given circumstances, forgets, probably, the conditions under which they succeeded, and that the conditions are not necessarily the same in his case. Let a man be master of the occasion and his position will be good, even if it be different from any that has gone before. Now what has to be done is simply this, and the remark applies equally to large or small game, birds, reptiles, or fishes. A beast having been slain, or a specimen secured, we have to remove the skin, preserving the external natural features, as completely as possible. Then, since the skin—cut as little as may be—would otherwise decompose under the influence of climate, etc., decay must be averted by the application of preservatives, and when packed so that it is protected, the trophy may be sent home. But the preservative and precautions necessary in an Indian or African climate, may be modified in North America, and in highlands

or lowlands, in forests or exposed positions. There

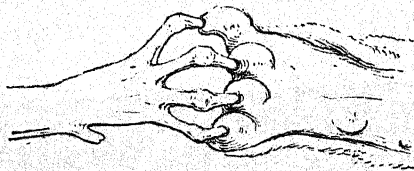
is, in fact, no preservative, or book-recipe, or tale of other persons' experience, that can compare in value to quick true judgment and cultivated common sense. I shall describe in as much detail as appears necessary the skinning and preparation of one representative of each animal class; and my reader must trust himself to adapt the practice by the light of his own judgment to the specimens, large or small, with which he may have to deal; and he will soon find his practice surpass in usefulness the most compendious (and cumbersome) book of recipes and directions.

SKINNING A TIGER.

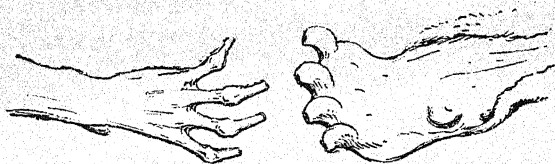


LARGE GAME.—When the animal is secured and ready for the operation, first turn it on its back, and

stretching apart the fore and hind legs, proceed to remove the skin as in the above illustration. In all cases where the skin is wanted entire, this is best done by making an incision from the corner of the mouth, along the median line of the belly to the extremity of the tail; but in doing this, cut only just through the skin, and be careful not unnecessarily to injure the carcass, and especially the intestines; next make lateral incisions in order to strip the limbs; for the fore legs



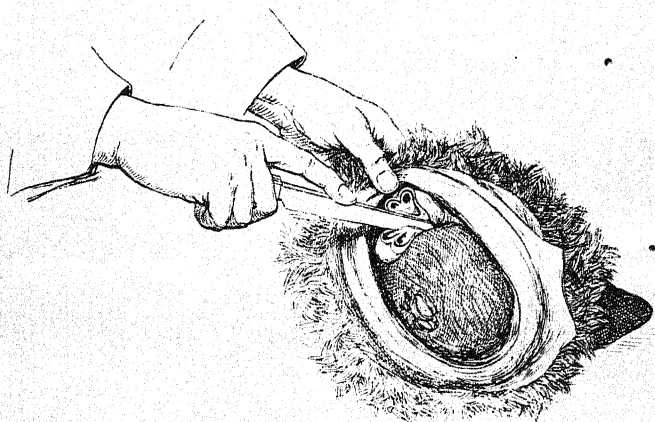
PAW SKINNED FIT TO STUFF.



PAW SKINNED FOR RUG.

from the edge of the central incision through the arm-pit, along the inner side of the limbs, the line of incision inclining slightly to the outer portion, in order that the seam may be less perceptible when the specimen is mounted. A like process through the groin is necessary for the hind legs. The incisions thus made leave the skin in the form of tongue-pieces over the breast. First apply the knife to these points, and detach the skin round to the spine and along the tail. In doing so it is necessary to clear the limbs, and great care must be taken to leave intact the natural features of the foot.

The last phalangeal bones may be left in the skin, whether with the smaller specimens of *Felidae* or *Cervidae*; but in the big animals it is better to remove them altogether. Now turn over the carcass, and draw back the whole skin over the head, exercising particular care in separating the ears and the eyes from the skull. Similar care must be taken as to the lips, and if the rim of the eyelids be severed by the scalpel the injury spreads in a remarkable manner,



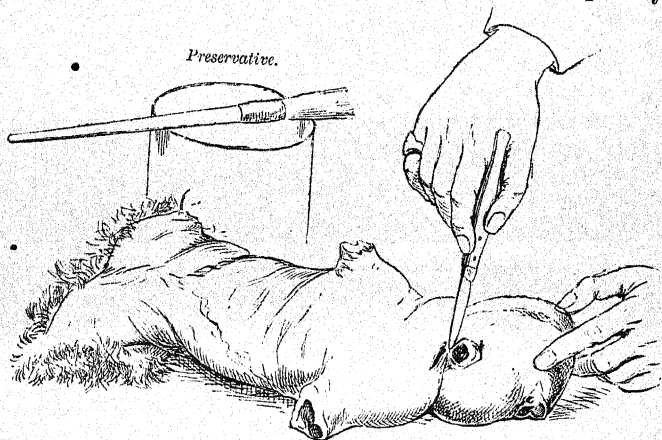
TURNING BACK SKIN OF EAR.

often so badly as to render the damage strongly conspicuous. The ears should be parted from the skull close to the bone, or their lower structure will present too large an aperture. The lips must be cut off close to the gums. Having thus taken off the skin, it must be cleared of superfluous fat and flesh—and all fat and flesh are superfluous. The cartilaginous portion of the ear must be turned through. The lip must be treated thus. Pass the knife between the mucous lining and the outer skin all round the mouth, so as

E.-C.-C.-L.

to admit of the preservative penetrating this thick portion of the specimen completely. The eyelids and the feet must each be treated in a similar manner for the same reason. Be careful that the claws or hoofs are well kept.

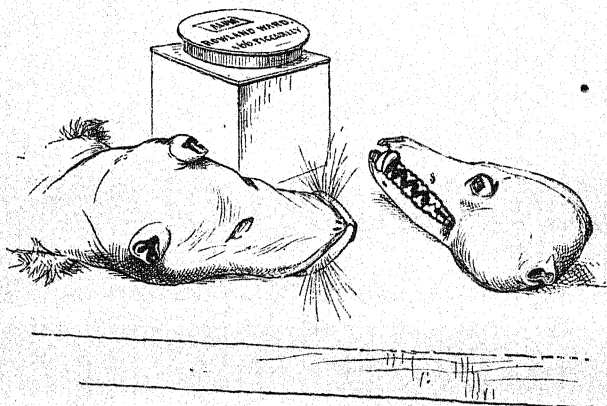
A great deal of the above description applies to the skinning of a fox's head, which I particularise because it is an operation that very frequently



SKINNING FOX HEAD.

exercises the amateur naturalist, and it well serves to exemplify the proper treatment of most hornless animals. The illustration on p. 42 shows the process of turning back the skin so that the cartilage of the ear may be operated on. The annexed cut is designed to explain the delicate operation of treating the eyelid—a part of the work over which the greatest care must be taken. The removal of the lip at its junction with the gums, and the cutting of the nostrils, are treated in the illustration on page 51.

A fruitful source of trouble to the sportsman in Ceylon, India, Africa, etc., is the proper treatment of an Elephant's foot. This part, as well as the head, is a recognised trophy, since it is a gauge of the size of the specimen, and also because in ordinary circumstances the skin of this mighty beast is so difficult of transport; and although it can be converted by skill into innumerable articles of domestic utility, its value



FOX-MASK SKINNED.

in private hands is by no means always appreciated. It is different with the foot, excepting that it is particularly suitable for conversion into useful articles, without impairing its natural form and structure. The foot should be severed at least twelve inches from the ground, and a cut made down the back side. Separate the skin from the flesh, and bring the casing of the foot away in one piece. Clean it carefully, and apply powdered preservative both inside and outside, then place it to dry in the shade, taking care that the skin does not fold, and is in all parts accessible to

the air. Although not absolutely necessary, it is desirable that the skin dry in natural shape. It is a good plan to insert a hard core round which dry sand may



ELEPHANT'S FOOT LIQUEUR STAND (Registered Design).

be pressed, so as to distend the skin as near as may be to the natural shape. The sand may be changed as required for the drying. It is important that the foot be protected from insects; and to this end, when the

specimen is quite dry, saturate it as far as possible with turpentine. Rhinoceros and Hippopotamus feet may be treated in the same way.

The foregoing treatment of a specimen will serve as an example of such adaptations, but the purposes to which portions of analogous trophies may be put are various and almost endless. Many a sportsman, when he has arrived home, has wished he had recollected as much when on the field. The hides of Elephant, Rhinoceros, Hippopotamus, Tapir, and of all Pachyderms, may be treated for a variety of useful purposes. If the whole animal cannot be saved, a part may be preserved.

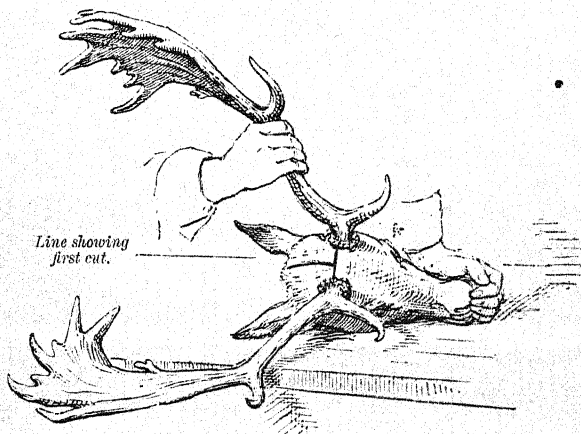
The shields or plates of a Rhinoceros—the thick portions of his hide between the folds—should for such reasons be brought away entire, and they can be made into table-tops, keeping their shape, or into trays, caskets, etc. By a process to perfect which I have laboured many years, and have patented, a beautiful surface-effect can be obtained under an exquisite polish. When large portions of hide cannot be transported whole, the skin may be cut into strips about 27 in. wide, from which sticks, whip-handles, etc., may be afterwards made. The applications are infinite. It must be remarked, however, that sticks thus made, although beautiful, are not well adapted to all purposes; because, if bent, much of their beauty—they look like semi-transparent amber—is deteriorated by an opacity that clouds their lustre where the bend comes. They are indeed more ornamental than useful; but for trays, boxes, cabinets, tables, etc., the material is admirably suited.

One of the most notable applications that has been made of the patent process was a large table produced

for presentation to His Royal Highness The Prince of Wales. The exceptional piece of massive hide obtained was African, and came from the Kilimanjaro district. It was nearly 4 ft. in diameter when made into a circular shape; and, after polishing, showed a lustrous surface like fine clouded amber, with transparent portions. The edging of this table was made out with a cornice of rough hide on which the epidermis remained, presenting a bold contrast to the lustrous centre. The supports were formed of polished Rhinoceros-horns, set on a base formed by the polished section, complete with its bark, of a magnificent coniferous tree, 2 ft. 6 in. in diameter.

Something must be specially said as to the head. It frequently happens that it is desired to save this for preservation as a trophy, while the rest of the skin is either abandoned or saved for a rug. Heads with antlers or horns are prepared for preservation either in the naked bone or to be set up to imitate living nature. In the latter case, care must be exercised to take the skin of the whole neck. Make the incision up the back of the neck, over the head between the ears until the horns are reached; if they are wide apart cut between them right and left, carrying the incision right round the burr of each horn. In separating the skin from the burr the knife should be used neatly, with a plunging action of the point, so that not a particle of hair or skin be sacrificed at this part. He is a bad workman who leaves a morsel of the skin attached to the bone. In clearing the scalp be very careful not to let the knife injure the skin, and more especially the eyelids, nostrils, and ears. The delicate skin round the eye is nearly hairless and must not on any account be torn or jagged. In a head the eyes

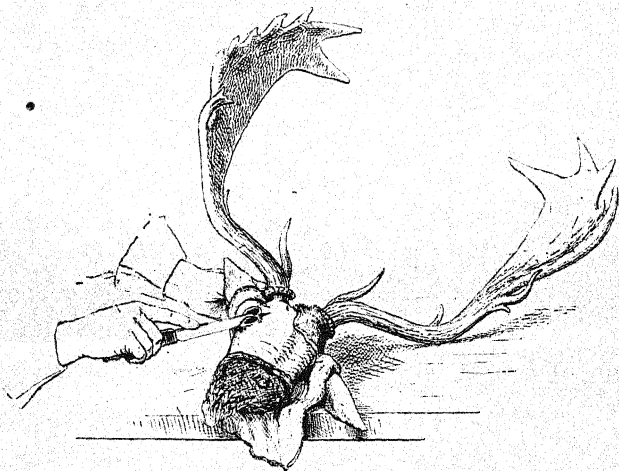
and nose are the most prominent parts, first claiming notice. In treating the nostrils and upper lip operate from inside the mouth; sever the lip neatly high up the gum, over the teeth; and in like manner detach the lip below. The skin presents in these portions a remarkable thickness, into which, from the inside, a neat midway incision should be carried all along, so that the preservative may penetrate and be carefully rubbed



FALLOW-DEER HEAD.

into the cut in order that these parts may be saved properly. The alum-process is perhaps the best; but if more convenient the skins may be preserved in pickle (see p. 29). Clean the skin well of all fat and flesh; rub in the alum, but not on the outside of the nose, and hang up the skin to dry. If there should appear any likelihood of the short hair round the eyes and nostrils slipping, apply some alum judiciously there. Be sure to save the lower jaw. When the head is of a Wapiti or other large animal, and is to be

set up with the skin on, it is often a matter of great convenience to pack the horns; and to do that, the skull, to which they are attached, may be sawn in two, longitudinally, by which much space will be gained. But if the trophy is to be mounted with the naked bone, this severance is inadmissible; and it should in no case be adopted with smaller heads, which are, in fact, quite



SEVERING THE EAR FROM THE SKULL.

destroyed by it, the skull being much weakened, and at the end of the journey often broken to pieces. Such a state of things necessitates great extra labour and expense, even if the injury can ever be repaired. North American trophies are frequently received in a deplorable condition from this sort of injury. For preservation in the bone, the flesh may be roughly taken off, and the skull cleaned by boiling, by maceration in a stream, or by burying

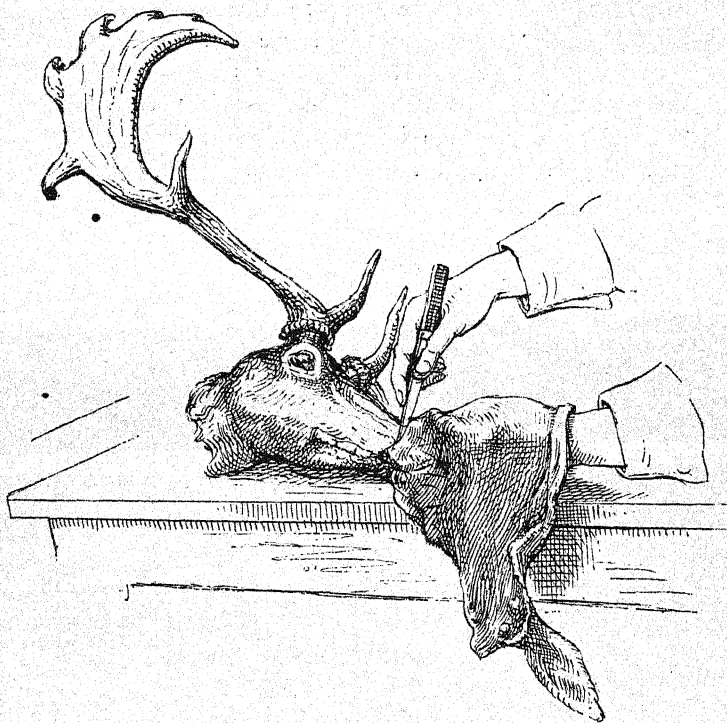
for a sufficient period in an ant-hill, or in sand, as described on p. 32. But be sure and keep the specimen from dogs or other animals. In regard to the ears, when the skin is removed, and you have separated the cartilage close to the bone, trim it neatly with the scissors of all not wanted inside,



REMOVING SCALP FROM THE CORNER OF THE EYE.

but do not take too much, or an unsightly hole may appear when the head comes to be mounted. Next insert the thumb and finger from the inside so as to separate the inner from the outer skin, forming, as it were, a flat bag; but do not carry this separation too near the edges. Into the line of division preservative must be carefully put. It is my practice to fill the space with composition, which keeps the ear perma-

nently of the proper size and shape. The old way of sewing a piece of card on the outside is not good, it allows the skin to shrivel and shrink, so that its natural beauty can seldom or never be restored. Some horns



SEVERING THE LIPS FROM THE SKULL.

(as of Sheep, Antelope, etc.) have "bearers," or bony cores, from which they may be detached and packed separately; in such instances the skull should be kept, and so much of the bearers as seems superfluous removed.¹

¹ See special instructions for packing, p. 49.

The horns of all Antelopes, Goats, Sheep, Gazelles should, when possible, be taken off and the grease and blood removed. If the bearers of the horns as well as the inner sides of the horns themselves be well turpented, it will save all risk of damage by insects.

Another attractive trophy is the foot. Whether it have a cloven or a solid hoof, many useful and ornamental things can be made from this part of the animal. To preserve it properly, the skin should be slit longitudinally at the back, but not detached from



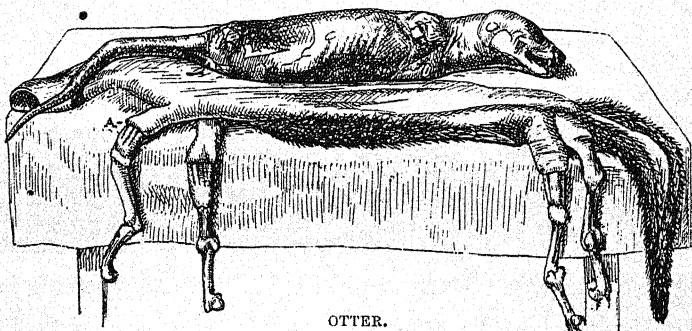
STAG SLOT PRESERVED READY FOR PACKING.

its juncture with the horny substance. All flesh, muscle, and sinew should be removed, as well as all bone not required. In the illustration the bone is depicted as it comes away from the hoof.

SMALL MAMMALS.—These can be preserved for dissection and preparation, when necessary, in spirits, or, as described in the cases of large skins, in liquor. When they are thus treated, incision must be carefully made in the trunk, and the intestines, with as much blood, mucus, etc., as possible, removed; the liquid will then penetrate, and the carcass should be soaked in spirit or liquor for some time, in order that the juices

of the body may be drawn into it, after which the specimen should be removed into fresh spirit, strong enough to light with a match, and so packed. The receptacle should be quite full.

In preparing the skin the following course should be adopted. The skull and the bones of the legs are to be left in the skin. The animal being placed on its back, make incision from the *sternum* (breast-bone) to the root of the tail, next separate the skin from the carcass, so far as can be conveniently reached, and sever



OTTER.

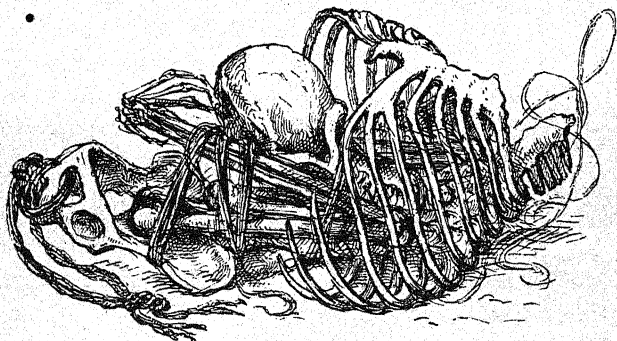
the limbs from the body at the shoulders and thighs. Each limb can then be drawn out—as a glove might be turned inside out—but the bone must not be separated at its junction with the toe, nor the skin of the foot or leg be in any way injured. Next remove the muscles from the bone. This can best be done by cutting the tendons near the toes, and carefully drawing the whole mass away at one operation. It must come in one piece, not piecemeal. The bone will now be clean. Clean the skin of the limb, and at the same time the other parts of the skin of all superfluous flesh and fatty matter. Dress the inside with Taxidermine

No. 1, and apply freely powdered alum all over it, but particularly to the fleshy parts, as the eyes, nose, lips, feet, etc. Then replace the bones in the limbs, having previously, if possible, bound them with tow, or similar material, so as to represent the muscle that has been removed. Place a portion of stuffing in the skin of the head and trunk, and suspend the specimen to dry. It may be added that the animal figured in the illustration is an Otter.

The tail may be treated in two ways. With an Otter, for instance, it should be cut underneath to the tip, and the bone removed; but in the case of a Fox, and most other small mammals, it should be treated thus:—Sever the *vertebræ* from the trunk close up to the body, leaving the tail in its sheath. Turn back the skin until enough of the tail protrudes to fasten securely with a string, that can be attached to a hook, or tree, or other firm holding. Then with a cleft stick, or the handle of your pliers, pull the skin sheath-down toward the tip, and the *vertebræ* will come away whole, wrinkling the skin to the end. Shake powdered alum into the cavity, or, if preferred, insert Taxidermine paste on a stick.

SKELETONS.—When it is desired to save the skeleton of an animal, the procedure should be thus:—Having removed the skin, cut the fleshy parts away; this need not be done too closely, neither is it necessary nor desirable in the operation to separate the joints. The bony frame, or its portions, should next be placed where they can be covered by water. The object being first to extract all blood, it is well, as occasion requires, to pour off and renew the water, until it comes away comparatively clear. The next process is to leave the skeleton in the liquid till the soft portions putrefy,

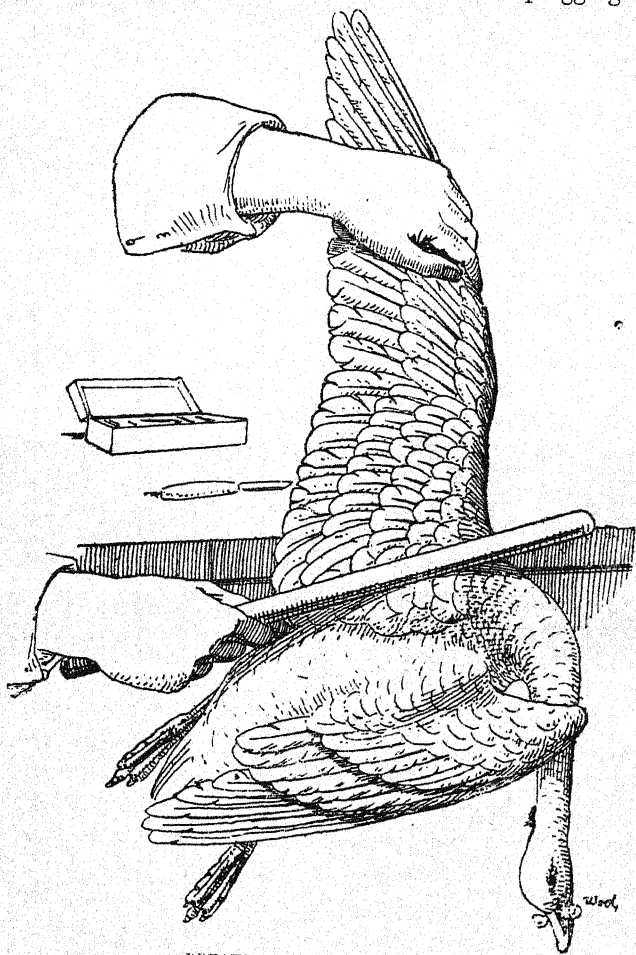
and so leave the bone clean. The large bones that contain marrow must be perforated at either end, where the holes will be least observed, and returned to the water. They will come clean in due course like the others. The process of putrefaction will occupy several months, but will be expedited by a warm temperature. When the decay of the fleshy matter is complete, the bones must be cleaned by hand, and should then be immersed for a few (say 6) hours in a weak solution of lime-water. The



ORANG SKELETON READY TO PACK.

bones are by this time quite separated, and it is all-important to see that not even the smallest be missing; a skeleton incomplete in any part being of no value. The bones must next be bleached by the simple action of the atmosphere in the shade. If the operator be abroad, the bones may then be packed for transmission; if he be where skilled assistance can be obtained, they are fit for articulation. In hot climates the teeth should be encased in wax or grease of any sort to prevent cracking. The illustration shows the skeleton of an Orang arranged for packing.

BIRDS.—Having seen that the cotton plugging of



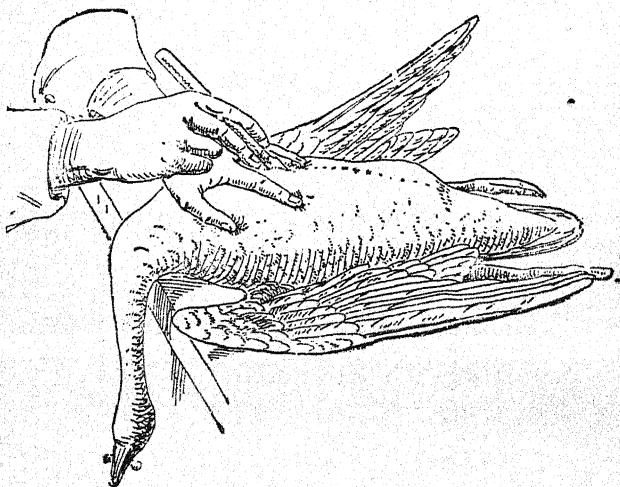
BREAKING THE WING-BONE.

the throat, nostrils, and the shot-holes are safe, the first operation is to break the wing-bones (*humeri*) close to

the body. In the case of a large specimen, the most convenient and effectual way to do this is to hold the bird pendent by its wing against the edge of a table or board, so that the bone may be fractured by the sharp blow of a stick, with as little rough treatment as may be. But the doing this skilfully is the gist of the whole work; and there is a proper way of doing it. The wing must be held by the upper feathers, pressed flat by all the fingers against the palm, so that the manipulation does not crush, or even seriously disturb the lay of the fibre. The blow with the stick must be a firm quick stroke of sufficient strength to complete the fracture, not simply to bruise the flesh, nor so rough as in breaking the bone to unduly mangle it. The firmness of the board or table-edge is a great element in the neatness of this operation. The action of the hand will best be seen from the accompanying illustration.

This is the method for treating large birds. In the case of small specimens—that is anything less in size than a blackbird—the same bone may be broken by the thumb and finger, or at most by the forceps. The wing-bone being thus broken, place the bird on its back, the head toward you, in order that your knife may, what is technically called, “go with the grain of the feather.” By this I mean that the point of the knife should be deftly inserted under the skin, just at the end of the breast-bone; raise the skin till it bags, then press the knife forward in one clean continuous incision down to the vent, so that the skin be separately severed, but the flesh remain uninjured. Amateurs are constantly inclined to make their first incision from too high or too low a point; and the mistake of injuring the stomach in any part is another

danger that besets them. The opening thus made in the skin should be no larger than is necessary for the withdrawal of the body. For this purpose only is it made. Indeed with birds that have breasts of specially beautiful plumage and short feathers, as well as with diving and aquatic birds, it is often desirable to make the incision under the wing. The great object is to get the body out of the skin in the cleanliest

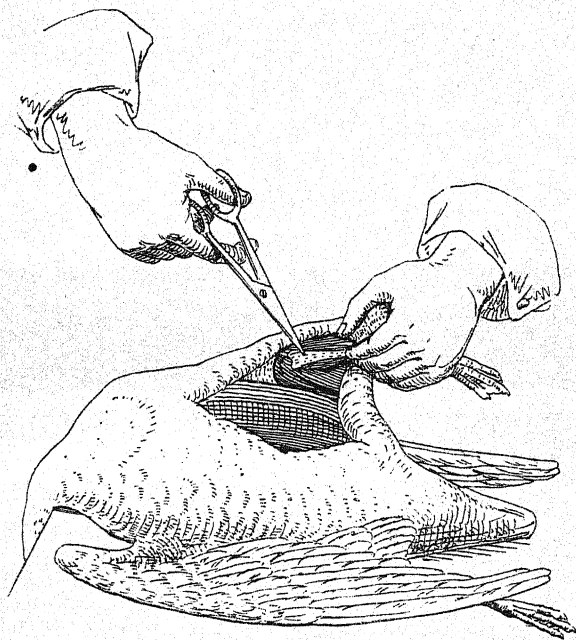


THE FIRST CUT.

fashion, so that none of the internal grease or juices soil the plumage. The overwhelming advantage of a neat operation, in which the body remains practically unbroken, will be apparent at once. Sometimes it may be desirable to take the body out through the back, when the incision is made in the same manner as it would be on the breast. In fact, the features to be especially preserved will rule the operator's choice in this respect. I, however, suppose the cut to be

made from the breast-bone, as seen in the illustration below.

Now put down the knife, and use the hands only, for the fingers are the best instruments. Insert the fingers under the skin on one side, and

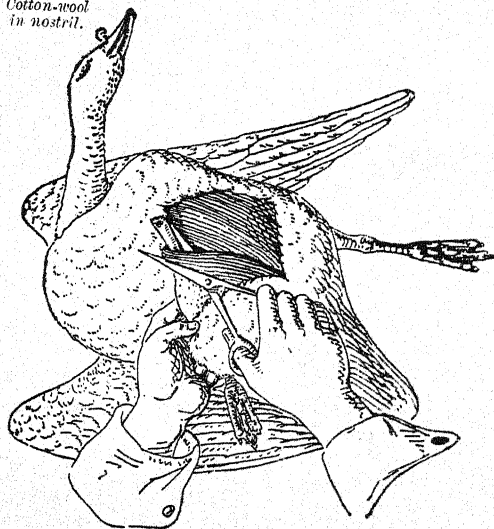


SEVERING LEG-BONE.

clear the skin from the flesh in all accessible parts. That done, insert below the skin a sufficient quantity of dry plaster of Paris, or such other similar material as you may have at hand, to absorb any blood or other moisture as may at the moment be present. Treat the corresponding side in like

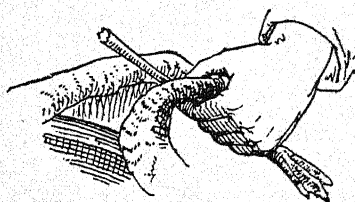
manner. Next proceed to force out the leg. In order to do this, hold it firmly above the joint, and

*Cotton-wool
in nostril.*



CUTTING THE TENDONS NEXT THE TARSUS.

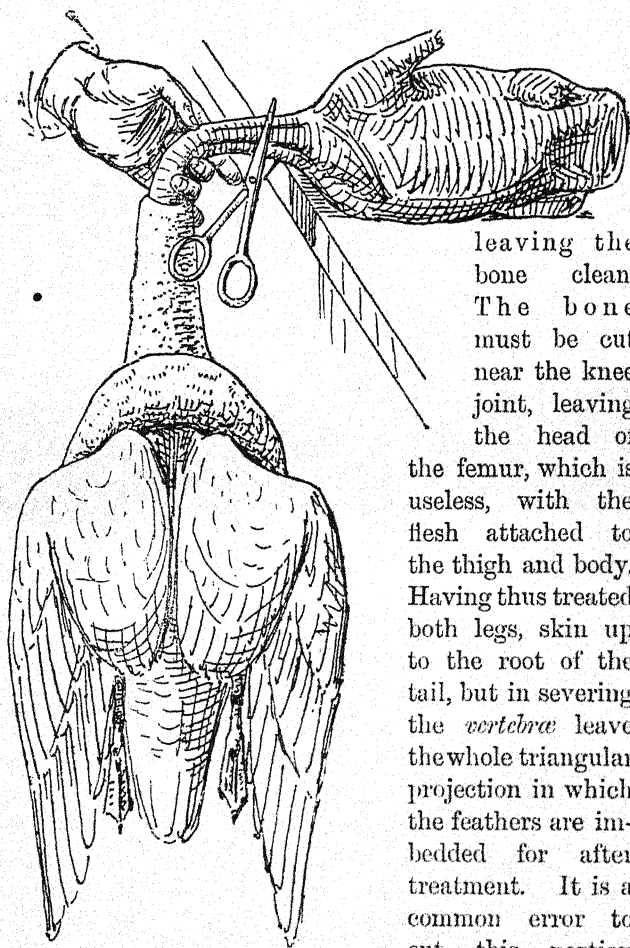
force the thigh through the aperture, at the same time carefully drawing off the skin: insert the point of the



(The bone, when thus freed, should appear as above.)

scissors below the flesh next the bone, and move them skilfully up between the bone and muscle, until, by raising the right hand a little, the scissors can be made to nip the bone transversely just against the joint; cut the bone through and you can then thrust it out naked from the flesh, and with

the scissors cut the tendons next the *tarsus*, and the whole muscle of the thigh will come away in one piece,



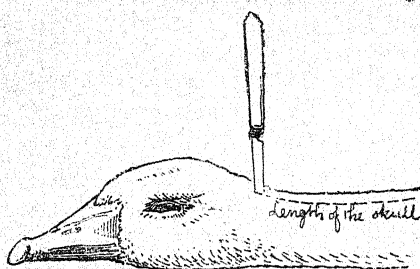
leaving the bone clean. The bone must be cut near the knee joint, leaving the head of

the femur, which is useless, with the flesh attached to the thigh and body. Having thus treated both legs, skin up to the root of the tail, but in severing the *vertebrae* leave the whole triangular projection in which the feathers are imbedded for after treatment. It is a common error to cut this portion

too low down, and much trouble results. Now turn the bird chest-downward in order to skin the

back. This is an operation requiring more care than that in front, because the thin skin has to carry larger quills, which are relatively more difficult to manipulate. The specimen is now lying breast-downward on the table, the head towards you. The whole skin of the tail should be drawn over the back, where the skin may be cleared by the blunt side of the scalpel, and the body will then be freed down to the wings. Here free the body by cutting the flesh through with the scissors at the point of fracture of the *humerus*, and thereupon separate it from the skin until only the neck remains to be severed, as shown in the illustration.

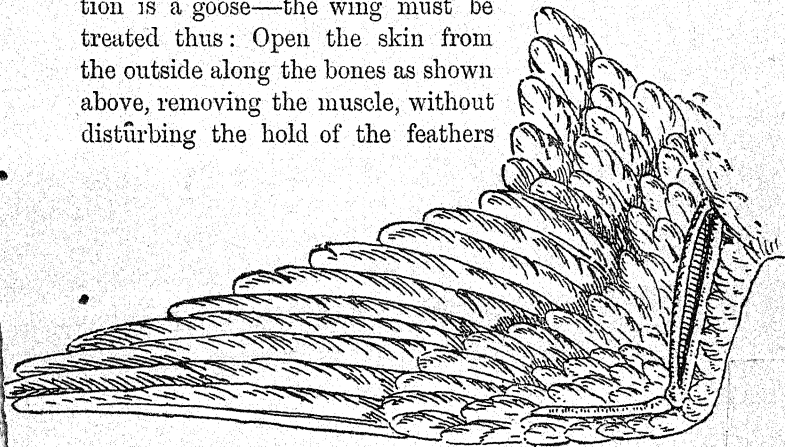
The next step is one requiring judgment and dexterity. The head must be got away. With ducks, geese, and similar birds, the head is too large to come through the neck-skin; and, in such cases, an opening must be neatly made from the back of the head, about two inches down the neck, of sufficient size to admit of the skull being removed for cleaning. Through this orifice force the skull, skinning it carefully until



past the eyes, and in doing this pay particular attention not to work any injury to the edges of the eyes, or to the ears; these last should not be rudely

touched by the knife. Cut away the back part of the skull, with neck, tongue, and palate. Remove the brain and the eyes. The whole skin is then in a condition to be cleaned and prepared. The next thing to do is to take away all fat and flesh, and make your skin as

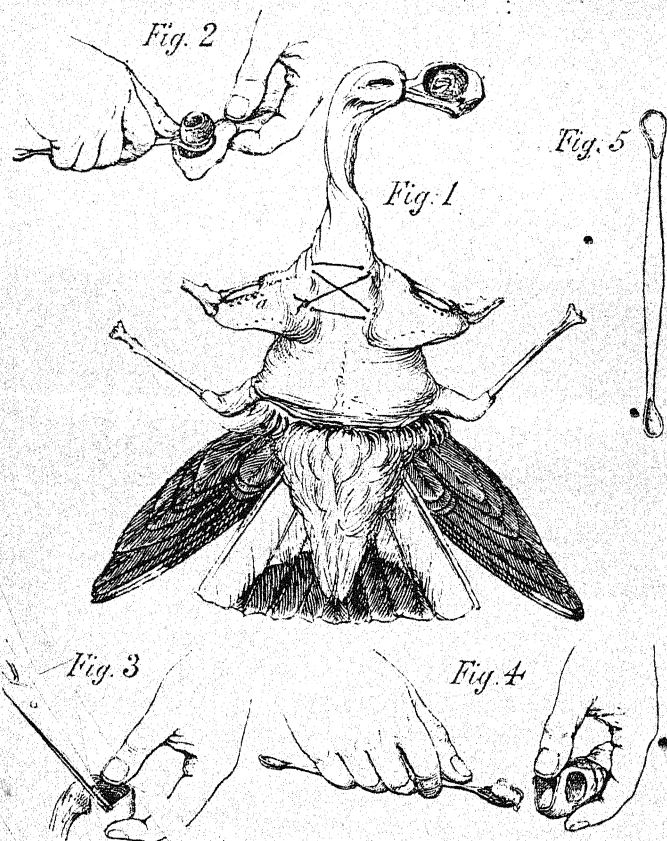
cleanly as you can; then dress the inside with Taxidermine. Bind some tow or wood-wool round the leg-bones where the muscle was, so as to restore them to their proper position. Put some cotton-wool in place of the eyes, and, having forced some Taxidermine into the skull, return the latter to its place. In the case of the large birds—the specimen figured in our illustration is a goose—the wing must be treated thus: Open the skin from the outside along the bones as shown above, removing the muscle, without disturbing the hold of the feathers



on the bone; the quills here joining the bone. It is important to bear this in mind, for if a serious error be made here the wing will be shapeless. Small birds may be treated from the inside.

The operations necessary to preparing a Peewit are figured on the cut on p. 64. This is the specimen with skin reversed, showing how the flesh can easily be removed from the inside without undue disturbance of the wing-feathers from the bone. The flesh is here entirely removed. The stitching necessary to take the loose skin of the wing is shown between the wings.

cerns the head. Carefully note that the skull in the case of the Peewit, and birds of similar anatomical structure, is sufficiently small to pass through the



to take in of the neck entire without injuring it. The skull
 some birds will not ~~allow~~ this operation, but a
 this ~~operation~~ ~~will~~ to success

SKINNING AND PREPARATION

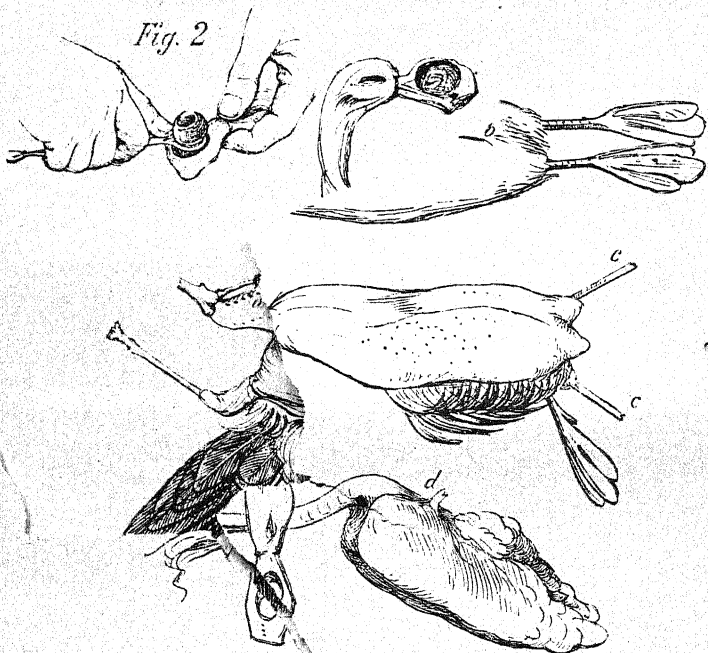
in idency of the hollow skin, at this part especially, is to of too large, and it is better for subsequent operations that it should be contracted rather than expanded strates thing approaching looseness. In setting up a brain; is far easier to stretch the skin, if required, the rem contract it; and now is the time to catch up after the away any seemingly superfluous folds. These

In the conspicuous on the back. To get rid of —its principal ~~ong~~ bones inside with a thread that that particular ~~care~~ back, and draw the wings together is better not to touch it ~~when~~ they may best represent of the skin should be made late^{ly} enable the feathers to the wing. The illustration given, p. otherwise appear, where the cut should be begun and ended, ne plumage at figure presents the skin reversed as ible, but is the body, *d*; the leg-bones, *c c*, and / and is of great protrude.

1. Having done It is not desirable to use powde areful in doing so skins, as it tends to make them bri. Use the scissor-should be filled out by stuffing to t^h tow; fill in the a band of paper placed round it j^uper position, and wings and other parts in p^{ro}per posit^{io}ce a paper During the whole operation, wood-dust, o^{ff} other dry powder, should be freely employed to al^sorb blood and grease, so that the plumage may be kept clean.

When the skin of a specimen has been taken off in the manner set forth above, there is a proceeding which it is, important to observe, technically called "making the skin." This is, in reality a part of the operation of skinning, indeed that part of it which consists in finishing the work in an artistic manner. While the skin is fresh and supple it should be so disposed that as it dries it may take proper form rather than distortion; much subsequent trouble being thus

cerns the head. Carefully note that the skull in the case of the Peewit, and birds of similar anatomical structure, is sufficiently small to pass through the



SKINNING A GREBE.

plaster of Paris, so that in handling the adhesiveness of the paste may not be inconvenient. It will be noticed that the skin between the wings, when raised from the bony structure, exhibits among the quills certain bare places, which would be most unsightly if they appeared prominent on the finished specimen. The

tendency of the hollow skin, at this part especially, is to be too large, and it is better for subsequent operations that it should be contracted rather than expanded to anything approaching looseness. In setting up a bird, it is far easier to stretch the skin, if required, than to contract it; and now is the time to catch up and stow away any seemingly superfluous folds. These are most conspicuous on the back. To get rid of them, tie the wing-bones inside with a thread that shall lie across the back, and draw the wings together as near as in your judgment they may best represent the position in life. This will enable the feathers to cover in the naked skin, which would otherwise appear, and will give solidity, so to speak, to the plumage at this part. This gives little present trouble, but is the saving of infinite labour in the future, and is of great consequence to the beauty of the bird. Having done this, turn the plumage out, but be careful in doing so not to fracture the skin of the neck. Use the scissor-forceps to fill in the neck with cut tow; fill in the body; smooth the feathers into proper position, and your whole bird into proper shape. Place a paper band round the wings, that they may set in good position. Small birds may conveniently be slipped into a cone of paper.

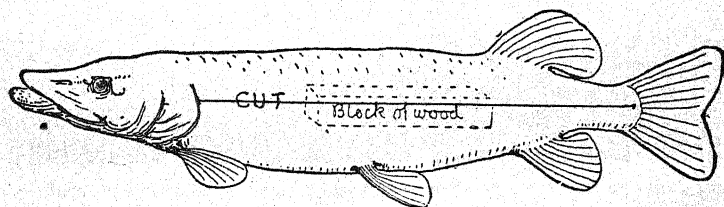
It may sometimes fall to the lot of the traveller to secure an Albatross, when he may not know what best to do with his unwieldy and not very rare specimen. If he does not care to preserve it whole, he may be reminded that there are some parts of it which may be profitably saved. The long tubular wing-bones are prized for pipe-stems, to which they are well adapted; the great web-feet make beautiful tobacco-pouches when properly prepared, or a curious small

work-bag for a lady may be formed of the same trophies. The wing-bones must be carefully cleaned, a good way being to open the orifice at each end, and boil them; or they may be macerated in water. The foot should be treated thus:—Sever the bone above the knee; cut the skin down the back of the shank and heel; insert the thumb and finger—you must not use any sharp instrument—so as to separate the web on both sides from the bony structure of the toes; carry this down to the outer talons, so that the toes can be drawn out of the web-pouch now formed; sever the talons from the bones on the inside with the scissors, leaving the talons attached outside; clean the skin neatly, and dress it well with Taxidermine paste; fill the pouch with wool, or tow, or sawdust, to keep it in shape. Of course the utilisation of parts of birds and animals in this way is mainly a question of inventiveness and ingenuity, for many natural objects may be adapted to useful and ornamental purposes, while at the same time retaining the character of trophies. The leg-bones of the Flamingo are long and have an elegant curve—they form admirable pipe-stems; the teeth of animals can be used ornamentally in many ways; the talons of a tiger, or the hoof of an antelope, or the tusk of a boar, as well as antlers, may be employed for adornment or use; and there is this advantage, that these may in some circumstances be saved, when the rest of the trophy has to be abandoned.

Birds may be kept in spirit, this mode being particularly useful for the preservation of nestlings in the down, very small specimens, etc.

REPTILES AND FISH.—As a general rule large specimens are skinned and preserved in similar manner to birds, although with reptiles alum may be used, espe-

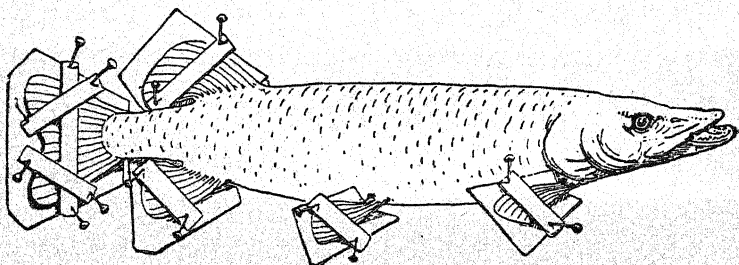
cially on the thicker portions of the skin ; but small specimens are kept in spirit. It must rest with the traveller himself to determine which course is best for saving the particular example he has secured. When a fish is skinned whole, it must be laid out carefully on a board, and the incision made not down the belly but along the centre of the least important side, from gill to tail. The object is to remove the body from the skin, with the least possible disturbance of the scales, etc. The skin can be manipulated neatly from each side of the incision. When, in this operation, you come to the base of fins, cut the obstruction



INCISIONS IN A PIKE.

inside the skin with the scissors, but so as not to sever them too closely, that they may not be unsettled. Cut in like manner the *vertebræ* next the base of the head, and next the extremity of the tail ; then, if need be, cut also those in the middle so that the flesh may be taken away in two pieces ; but this is a matter of convenience, and must be made to subserve the all-important point of not disturbing, bending, or otherwise injuring the skin, for the scales that constitute the characteristic beauty to be preserved are very fragile and easily detached, and to break or detach them is fatal to the value of the specimen. Clean the head as well as you can, and then paint the

whole interior surface of the skin with Taxidermine, and apply the same preservative to the head, into the cavities of which cotton-wool may be pushed. The body should be filled with dry sawdust or sand up to its natural shape; next draw the edges of the orifice together with neat stitches. The fins and tail should then be treated. These, while wet and pliant, should be set out in natural form on pieces of card, so that they may dry as they are intended to be displayed. The specimen may now be put on one side to dry, and the sand or sawdust removed when it is dry enough.



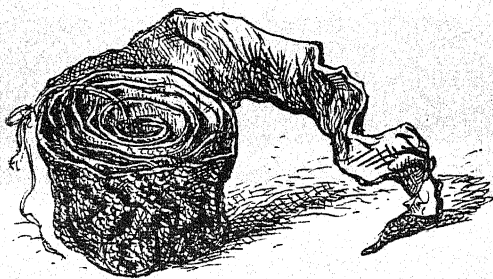
PIKE MOUNTED.

This process, however, rather presupposes the opportunity for quiet treatment at home. When the naturalist is in the field, a shorter process may be used. The skin, being removed and dressed with Taxidermine, may be left to dry in convenient form. The skins can then be packed together, and it will be found useful to pack with them some light stiff material like thin wood, dried rushes, etc., that disposed longitudinally will prevent the possibility of the brittle skins being bent accidentally.

Tarpon may be saved in the same way, although a

lot of work will be required to remove the grease from the skin. Even in professional hands in London, to remove the grease is a difficult and expensive operation, and specimens which have not been properly cared for are useless as trophies. For convenience of packing, and cheapness in transport, the specimen should be left hollow, care being taken that the fins are protected when packed. A common practice in Florida is to save only half the fish; but when I was there I had no difficulty in preserving the entire fish, as illustrated on p. 70.

Recently I have received Trout from New Zealand which had been packed in ice and kept in a refrigerator



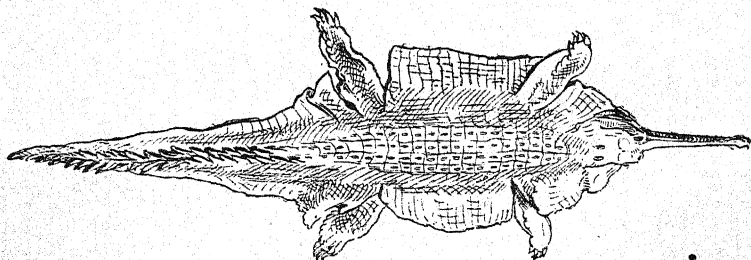
SNAKE SKIN.

for months. A mounted specimen now forms part of the collection at the Imperial Institute.

In skinning large snakes, after the body has been removed, the skin, properly treated with preservative, may be conveniently folded like a ribbon round the head, until it forms a small portable bale of similar form to that figured in the illustration above.

The smaller fish and reptiles, when preserved in spirit, should be saved as unaltered as possible in form. Carefully preserve the natural appearance of the

creature so far as may be; and it is very important that on a label (of tinfoil or paper) attached to the specimen itself, or to the receptacle wherein it is placed, should be noted a sufficient description of it made at the moment it is fresh before you, especially of colours and appearances and features which may disappear or be altered by the spirit, unless the species be well known and these details are manifestly un-

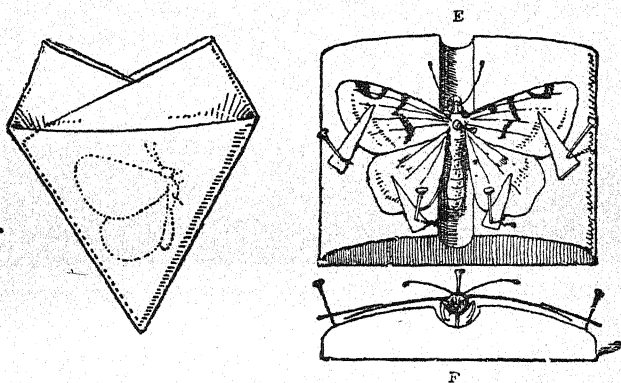


GARIAL SKIN FIT TO STUFF.

necessary. Be particular to record the locality where the specimen was captured.

INSECTS.—The ingenuity displayed by the collector in capturing and storing insects is often a personal quality, and the methods that may be adopted are almost infinite. The general methods most approved are all that can be referred to here. Butterflies, moths, and certain other insects, whose beauty is in their colouring and is very fragile to the touch, must be treated for storage and preservation in a different way from beetles and insects of similar durability. In fact, all excepting the first-named may be preserved in spirit so soon as captured for after treatment, and need not be injured by the process. For permanent display in the cabinet, all insects must be properly

set out—the *Lepidoptera* with distended wings, and the *Coleoptera* in suitable position. They should be killed the instant they are captured, to prevent injury resulting from efforts to escape. A gauze net is generally used. When a butterfly has been netted, the collector watches his opportunity while the insect is still in the gauze, and so soon as it closes its wings he lightly and sufficiently pinches its *thorax* between his thumb and finger. The butterfly falls from the



BUTTERFLY IN ENVELOPE AND ON SETTING-BOARD.

net dead and uninjured. The specimen must not be handled excepting to pick it up by the legs, holding which the wings may be slightly blown apart and a proper pin pushed through the body, so that the specimen with closed wings may at once be stored in the collecting-box, or if the creature be not quite dead the pin can be inserted on the under part of the cork in the cyanide-bottle, and the specimen kept there till dead. Butterflies should be stored thus with folded wings, until they are required to be set out for the cabinet. When the collector reaches

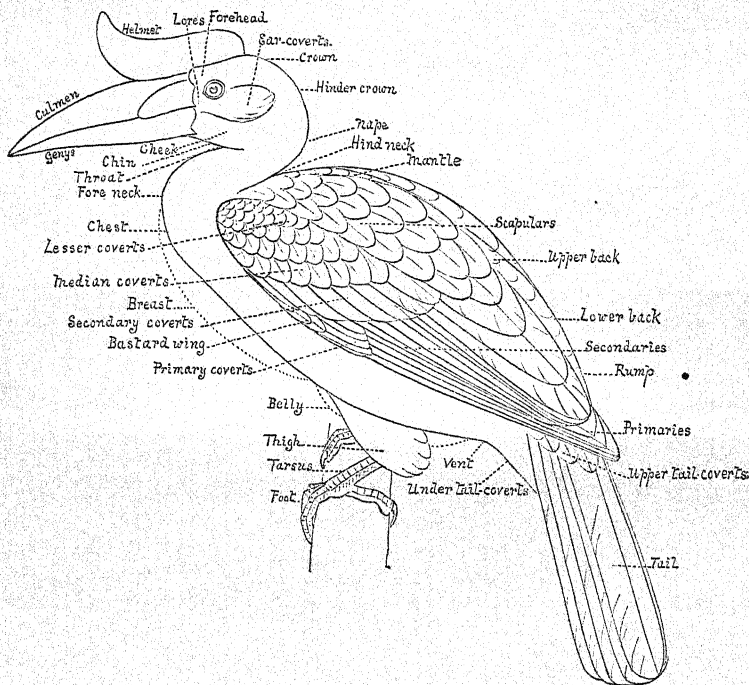
home, he can store the contents of his pocket-box, by putting each specimen in a small triangular envelope of paper, outside which a note may be made. Hundreds can be stored in small space. Moths, on account of their greater rotundity, must not be treated in exactly the same manner by pinching. They are not frequently captured in the gauze, and are best killed in the cyanide-bottle, or by the application of a little prussic acid. They are conveniently taken home in separate pill-boxes. Beetles, etc., may as a rule be preserved in spirit, which kills them forthwith; or they can be killed in the cyanide-bottle. When the time arrives for arranging insects for the cabinet, the Butterflies can be relaxed by placing them for a time on wetted sand, or exposing them to steam. The wings, legs, etc., can then easily be set out by the aid of small pieces of card on pins (see p. 73, Figs. E, F). Beetles, etc., should be set out while they are wet when taken from the spirit.

In England, as well as on the Continent of Europe, many entomologists now study the exotic species, which they can obtain from friends or correspondents residing abroad, either in the *ovum* or egg state, or in the chrysalis or *pupa* state. Most people know that from the eggs (*ova*) of Butterflies and Moths come out caterpillars or *larvæ*. These *larvæ* moult several times, and after each moult, in some species, there is a remarkable change in the colour of the *larva*. The *larvæ* of many species of *Lepidoptera* burrow into the ground to change into the *pupa* state, and sometimes they form a shell in the ground; some turn into *pupæ* in leaves, others on the ground in a sort of web. The *pupæ* of Butterflies are most often found on grasses, twigs of shrubs, or on trees; others on walls or fences.

The *pupæ* of many species of *Bombyces* are inclosed in cocoons most often found on trunks, and especially on branches of trees. Some of these cocoons are remarkable for their size and the beauty of their silk. When the leaves of the trees have fallen, these cocoons are easily seen hanging from the branches. In some species of *Lepidoptera*, the *imagines* (perfect insects), male and female, are very much alike, but the body of the ♂ is larger than that of the ♀. The Moths of the male *Bombyces* have *antennæ* (horns) very much more pectinated than those of the female; the body of the latter also is generally much larger. Persons wishing to rear the *larvæ* should keep the Moths in cages, in order that the eggs may be secured.

With respect to the rearing of the *larvæ* of large *Bombyces*, the following plan may be adopted till the second or third stage. Use large bell-glasses, with a few holes in the dome, or glasses open at the top, which in this case must be covered with gauze. Place these glasses on saucers full of sand covered with pieces of paper. Through the paper stick into the sand some branches of the food-plants proper to each species. Place the young *larvæ* on these. Under bell-glasses, which, of course, must be placed in the shade, no water is required to keep the little branches fresh, and the young *larvæ*, which are apt to wander till the first or second moult, cannot escape. When the *larvæ* are large, it is best to rear them on large branches plunged in water, and without the glass covering. This refers to the rearing of the large silk-producing *Bombyces*, and of all those forming some sort of cocoon. When the *larvæ* have to bury themselves to change into *pupæ*, it is of course necessary to rear them in a box containing a few inches of mould. This method should always

be adopted when the habit of the *larvæ* is not known. Breeding-cages, which, as a rule, should be large, must have their sides of perforated zinc to give air. Cages ought to open by the middle, like two boxes



TOPOGRAPHY OF A HORNBILL.

open on one side, and placed one over the other, and fastened by hinges.

When *pupæ* have to be sent to England from very distant countries, especially if they have to cross the tropics, they may be conveniently transmitted in small strong boxes by sample post; each box not to exceed

eight ounces, and to be registered, placing the stamp where the cancelling will do no harm. The *pupæ* should be sent as soon as they are formed; and if underground *pupæ*, they should be placed in soft damp moss. The boxes should also have a few holes in the sides to admit air.

If boxes containing *pupæ* or *ova* of *Lepidoptera* could be placed in the ice-house on board ship, which would retard considerably the emergence of the Butterflies or Moths and the hatching of the eggs, valuable species might be sent from very distant countries. Salmon *ova* were thus safely forwarded from England to Australia and Tasmania.

ARTISTIC SETTING-UP OF TROPHIES

IN order to reproduce the lifelike form of any animal by the perpetuation of its preserved natural features, not only technical skill, but knowledge and artistic feeling are necessary to the production of a satisfactory result. Formerly, the process aptly termed "stuffing" was employed. The results were seldom or never of a very high value, especially in regard to the mammalia. The fact was too often ignored that the use of astringents, necessary to preserve a skin, invariably distort it, and that this distortion differs even in several parts of the same skin, by reason of the varying thickness or even the condition of health in which the animal was killed; for instance, the skin of a fat animal is liable to undue expansion, that of a poor beast, to peculiar contraction; and mere stuffing can give only an untrue representation of the living creature. It is therefore incumbent upon the operator, firstly, to make himself thoroughly acquainted with the habits of the animal in a state of nature; and next to choose some incident of the creature's living existence which he desires his specimen to illustrate. This will enable him to arrive at his design. He must then make himself acquainted not only with the bony but with the muscular structure of the animal, by the

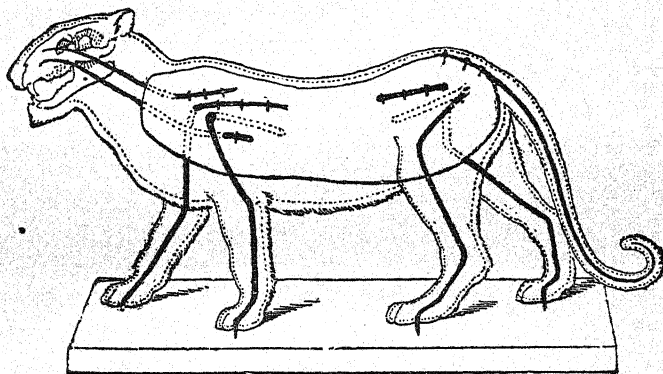
aid of which knowledge he may, if he have the requisite technical and artistic skill, produce a *model*, whereon may be placed the skin and other parts of the specimen in such a manner as to make as perfect a representation as practicable of the living animal, in form and detail. This is the only means whereby noble trophies can be made to have more value than a paper description of them would possess. On the individual skill, knowledge, and taste of the artist depends the real value of the work,—in the same way as that of the sculptor, or painter, is in degree to be estimated.

A typical animal to illustrate the propositions laid down above is the Tiger, on account of his various and picturesque habits, his magnificent proportions, and great beauty. I shall, therefore, describe the setting-up of a specimen of this feline in detail. But here a qualifying observation must be made. No book description can adequately convey all that should be known. To learn what is necessary the personal instruction of a good teacher, and the smallest modicum of experience, are worth more than any printed course of instruction, however ostensibly complete. We will suppose then that a perfect skin, in good condition, has been procured. Let us select the simplest action of the creature, viz. his stealthy walk through a grassy jungle, which is his habitat, when his peculiar expression is that of constant caution, whether he be in retreat, or advancing, with the snarl of ready offence which is habitual with him. This is the design. As digitigrade quadrupeds, the cats walk on their toes, and the claws being retractile are then concealed. The left hind leg and the right fore leg, or *vice versa*, are used together in progression. Many instantaneous photographs can now be purchased from which one

may see many features quite indispensable to the home worker. There is a difference in the pose of the ear to express alertness, caution, or anger. In the first case the ear is erected, it is partially depressed when the beast is only cautious, but in anger, or incipient anger and alarm, it is levelled with the skin of the head. We will choose the semi-depression. The mouth should be partially open, showing the teeth and tongue, but the lip not raised, the expression being that of slightly panting. In order to produce this design, first study the skin and form a judgment of its natural dimensions, as to height, bulk, etc. A special preparation of the skin is necessary as a preliminary to this. It must be what is technically called "shaved" or "fleshed." This process consists in first softening the raw skin—which is very often native-dressed with lime—by sponging the inner side plentifully with liquor. The skin is then placed on a rounded beam conveniently, and what is termed the "pelt" is removed, by scraping and shaving, with a currier's knife, the edge of which is turned peculiarly for the purpose. Great care must be exercised in this operation or the edge of the knife will often go through the skin and so damage the hair-side. This shaving, by reducing the substance of the skin, renders it elastic and better adapted for use on the model, which must be now constructed. The head, with the lips, eyes, and cartilage of the ears, as well as the feet, must be carefully shaved with an ordinary knife, skilfully manipulated. Now fold over the skin with the hair outwards, so that the limbs accord with the intended position; measure the points and make the best estimate possible under the conditions as to bulk, etc. The limbs should be folded and the whole

arranged as nearly as may be to give the outline of the animal.

In making the model first deal with the trunk. Two $1\frac{1}{2}$ -inch boards, 11 inches wide, of proper length, should be glued, and what carpenters term "dowelled" together by the edges. Place the skin as folded to represent the animal flat on this board, and from it draw thereon the outline of the trunk. Cut the board to this outline—to the inside of it, so that



"MANIKIN" FOR A TIGER.

room be allowed for the modelling of the muscles on this framework. Get four iron rods— $\frac{5}{8}$ -inch is the medium gauge—for the legs, one for the tail, and two to support the head. Bore a hole through the board where the *scapula* or blade-bone would come. Through this pass the rod till about 15 inches are on the other side, then bend this portion sharp round at right angles, to be fastened by staples firmly along the board in the direction of the hind quarter. At about 3 inches from the board bend the rod again, and incline it forward at such an angle as represents the

natural position of the *scapula*; then bend the rod back again for the *humerus*, and once more forward for the *ulna* and *radius*, then shortly for the carpal and metacarpal bones. This is the extent of the rod, which must now be taken through a wooden stand and fastened under it. It will be seen that this iron, which must be repeated exactly on the other side, is intended to take the place of the absent bones, and that it must stand away from the board just such distance as the original bones would have occupied. The hind legs should be treated in similar manner (see diagram). The iron for the tail must be appropriately bent, and attached to the board in position; as also the two irons to support the skull, which must now be attached.

The next operation is to model with "wood-wool," now largely used for packing. Bind firmly with hemp. Coarse wood-wool may be used to start with, and the model finished with the finer and softer quality. I had this substance first made for this particular purpose many years ago, long before it came into general use for ordinary trades. When finished the whole can be covered with clay, which allows an amateur to make alterations if required at the time. I use a particular substance of my own invention for modelling, which dries as hard as marble without any shrinkage, and is never brittle. The first group, "The Combat," that I was able to produce by this means, was exhibited in the International Exhibition (1871), in Division III. (*Scientific Inventions and New Discoveries*). The wood, representing bones, should be made in pieces, much as a lay figure is made. The pieces then being sawn through the centre longitudinally, a hollow space should be cut out, not only to lighten them, but that they may be riveted together

over the iron, so that the rod occupies the place, as it were, of marrow in the bone.

The trunk must be built up so as to be light and hollow, but with a suitable surface to receive the clay. Behind the shoulder, midway, and next the thigh, should be fixed, on either side of the central



SCENE FROM THE JUNGLE (INDIAN AND COLONIAL EXHIBITION, 1886).
DESIGNED, AND THE ANIMALS, BY ROWLAND WARD.

board, segments of 1-inch board, of proportion sufficient to give the required bulk, and to secure the contour of the ribs, etc. A nearly circular board must be shaped to distend the neck. Across the edges of these boards coarse, strong canvas should be neatly tacked, small laths being inserted at proper places to prevent the canvas sinking. The rod which is to

support the tail is covered with tow or wood-wool, neatly bound on to the required form, and then in like manner sewn up in the canvas. The same material is also extended over the skull, whereon the fleshy excrescences must be properly represented by tow, etc. We have thus a complete light framework covered with strong canvas, excepting the limbs. On all necessary places over the whole framework a surface of modelling clay is to be worked. The ribs and prominent muscles of the trunk, the muscular development of the shoulders and haunches, the joints and extremities, must all be carefully modelled on. Ordinary modelling clay is used; and when the model is finished, and nearly dry, paper should be pasted over the clay to prevent it from breaking away. A good method is to perfectly steep brown paper in a pailful of hot paste. The softened paper can be put in small pieces over the clay, and readily adheres.

The model is now complete and ready to receive the natural features of the animal. First of all the eyes must be carefully adjusted in a natural manner; the claws must be next inserted in position. It remains to place the skin, which must be again damped with liquor till quite soft, and in this state carefully arranged on the model. First manipulate the head, paying particular attention to adjust the lips, eyelids, and ears properly, so that the required expression may be secured. It is advisable now to tack together the edges of the skin in certain places, as under the throat, the four joints under the armpits, and at the groin, midway under the belly, at intervals along the tail and the limbs. Adjust the soft skin to the inequalities of the model, using a "piercer" and the thumb. The seams must be carefully and neatly

sewed up. A delicate and important operation remains. The skin should fit perfectly all the indentations of the model, and in order to attain this, the skin, when worked wet into the recess, should be secured wherever necessary by drawing-pins, which must not be withdrawn until the model is perfectly dry. Then, the pins being removed, the fur can be cleansed in the usual way, viz. by rubbing with the hands very fine mahogany dust all over the coat; and then beating it with a fine cane, and finishing with a brush. The tongue, which is modelled in clay, and tinted, should now be placed in the mouth, where the tinting can be finished. At the same time, the lips, eyes, and nose can be tinted and finished. The pigment used should be the finest tube oil colour. It is best before painting to cover the mucous surfaces with hot wax, which promotes the naturalness of the appearance most materially. The whiskers which may have come from the skin should be carefully replaced, and if missing, imitation ones can be made of the quills of feathers.

Accept it as a golden rule never to cut the skin.

The method described above is given on the supposition that the skin is in the condition ordinarily received from India, cured by native practitioners. But in cases where the skeleton of a beast is preserved, and is available, much of the work may be saved by utilising the bones, especially for the limbs; and in any case they furnish the true proportions of the animal, which are so difficult for the inexperienced operator to arrive at without them.

The mounting of Head Trophies is best achieved in the following manner. If the head has been received in pickle, the skin should be thoroughly cleansed in cold fresh water, and directly afterwards should be

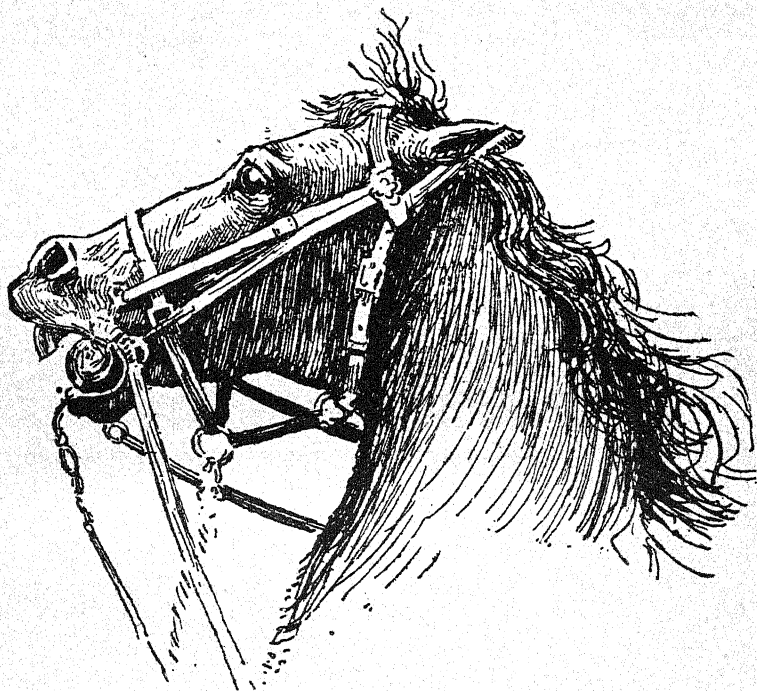
shaved on the flesh side, as directed in the case of the tiger-skin. Whether it be the head of a Tiger, a Stag, or a Bison, the process is the same. A proper estimate must be taken of the length of neck. What



FROM THE COOCH BEHAR TROPHY. ROWLAND WARD fecit.

is called a neck-board must be prepared accordingly; that is, a framework to which the skull is to be attached, and whereon the skin of the neck can be distended properly. This board is a flat piece of inch deal, 11 inches wide, cut to the shape of the neck, as the central board is shaped for the trunk of the tiger.

The construction is on the same plan, the form being modelled in like manner. This neck-board is fixed to a heart-shaped back-board, by means of which it can be hung against a wall. The skull and horns having



STUDY OF A CHARGER. DRAWN FROM A MODELLED HEAD.
ROWLAND WARD *fecit.*

been firmly fixed on the artificial neck, the skin should be placed on the model and carefully adjusted. In well-prepared trophies the seam should be up the nape of the neck, and the throat intact. The nostrils, lips, and eyelids of the Stag, or Bison, should

be moulded with particular care and artistic feeling, clay being injected between the mucous and outer skin of the lips, nostrils, and eyelids, so as to give them the rotund, fleshy appearance they have in life. It is better to insert the eye in its orbit before the skin is drawn on. The ears must be manipulated into shape while they are drying; and when the specimen is dry it can be cleaned in the usual manner.

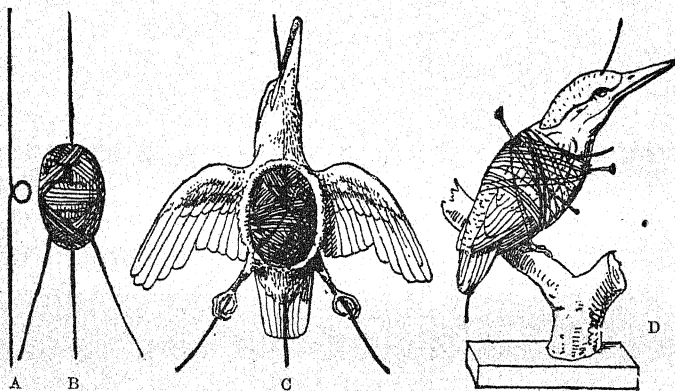
Of small mammals the Squirrel will probably serve best as an example, and in this instance I shall presume that the skin has just been removed from the animal in a fresh condition, according to the method fully described on p. 53. It is always an advantage to set up a skin while it is fresh. Annealed iron wire of various sizes will be required, and can be obtained at an ironmonger's. Sizes:—Wire—1 to 5 for large animals; 13 and 14, Gulls, Pheasants, etc.; 15 and 16, Partridges, Grouse; 17 and 18, Thrush; 19 and 20, Dunlin; 22, Finch; 24, Tits. Prepare a body-wire about 12 inches long, and of the thickness of ordinary whipcord; cover this with tow or wood-wool to the size of the carcass that has been removed, and bind the tow neatly with hemp; in fact, shaping the tow as nearly as possible to represent the form of the Squirrel. For a sitting position, bend the wire so that the artificial body have the necessary arch of the back. The end of the wire next the tail must be turned and concealed in the body. Certain stitches through with a long needle will assist materially in shaping the form and strengthening the frame. A wire covered with the requisite quantity of tow will form the tail. Four wires, each about 8 inches long, will be required for the limbs. Pass these wires severally

through the fleshy pads of the extremities, and bind the bones to the wire with cotton, taking care to leave about 2 inches of wire beyond the *humerus* and *femur*, so that they may be passed into the frame of the body and clinched. Next fill out each limb by carefully binding tow in proper proportion round the bone. Never exceed the natural size. The bones having been returned to the skin and the limbs completed, the upper end of the body-wire should be cut so as to protrude only 1 inch, and then inserted in the skull, the whole skin meanwhile being turned over the skull. A stitch driven through from eye to eye will fasten the head securely to the artificial neck. Small portions of tow should be inserted where the flesh has been taken from the skull, which can then be returned and the skin drawn into its position. The limb-wires can now be inserted in the body and clinched. The skin having been properly drawn over, the parts may be neatly sewed up, the limbs bent to their natural position, and the wires of the feet passed through a stand so as to be secure. It will be found advisable to manipulate the skin with the "piercer" and thumb, in order neatly to adjust it, and finish the specimen to taste. The eyes should next be inserted by adhesive glue paste. The fur should not be cleaned till the skin is quite dry.

Reptiles may be treated in precisely the same manner.

Birds, when the skin has been properly removed and dressed, as directed on pp. 63 and 64, should be set up in the manner following. Choose the best side of the specimen to show, or if it only has one leg, place it as if sitting. Should the feathers on the neck be bad, mount your bird as if asleep. For example, a Pheasant, say

freshly skinned, should have a similar body-wire to that employed for the Squirrel, but proportionately stouter to sustain the extra weight. The leg-wires should be half as stout again as the body-wire, and inserted at the back of the *tarsus* where the tendon runs. The fleshy part of the thigh must be made up in the same manner as directed in the case of the Squirrel, while the body and neck are to be formed on the body-wire (see Fig. A) in precisely the same



KINGFISHER.

way. In the illustration, Fig. A is the body-wire; Fig. B is the same dressed neatly with wood-wool bound with thread to the size of the bird's body; similar wire must be appropriately dressed for a long-necked bird. With most birds the neck is almost hidden by the feathers; but some species (like the Heron) have necks requiring special treatment. With the last named the substance is formed on the wire. With the first mentioned, but little stuffing is needed, and that can be loosely inserted before the wire, which may be pushed

through it. One end of this body-wire is thrust up the neck and right through the skull, so that it appears through the top; while the opposite end is made to protrude from the other extremity to support the tail. The leg-wires must be inserted through the sole of the foot and under the skin up the back of the leg where the tendon was, until the pointed wire is worked between the thumb and finger to equal position with the thigh-bone; push this bone with the wire through, bind both with the requisite wood-wool, and draw them back into the skin of the thigh, then continue working the wire on, until it has progressed enough to pierce right through the tow on the body-wire. The leg-wires must cross, and where they cross in the body they must be firmly twisted together with the pliers, so that the junction is covered by the tow. Much depends on the firmness of this fastening. Next insert such wool as may seem necessary to fill out the breast, and sew the skin neatly up. Dress the feathers smooth and bend your bird into shape, next wire him on to his perch, or other stand, whereby you gain use of both hands. Place a short wire through the quills of the tail to spread the feathers. Set the wings into position with wires, and insert a pin wire into the back, another into the breast; then, by means of these, lightly bind the specimen with cotton so that the feathers may dry in proper position. The symmetry and natural pose of the specimen should be a matter of most careful study. No amount of technical skill, or of imaginative power, will in the least compensate for the want of knowledge of nature. To have seen the bird healthy in its natural habitat, and to be able to reproduce its natural appearance, is an inestimable advantage. We cannot all of us command that; but

we may rely on the information communicated by others who have had such opportunities. My late father, when travelling with Audubon, accumulated an inestimably valuable store of such information; for it was the invariable practice of that great naturalist directly a specimen was secured, and before any treatment, to have a sketch made of it, in the carefully observed natural position of life, with record of all colours and contiguous, or surrounding, natural features. Nothing is worse than to give a pretended character to a specimen, or to mount it with details that are out of place—such as to put ferns and grasses with birds which never existed where such ferns or grasses grew, or to put sea-weeds with creatures who do not frequent the ocean or sea-shore. The true sportsman-naturalist should esteem the record of an animal's pose or habits in life as important as any other record, so that when the specimen comes to skilled treatment the naturalness of it may be a feature that enhances its value in every way. The line of form in many animals is not given by the skin, but by the fur, or feathers, as the case may be. He spoils a restored specimen who destroys this character by too much smoothing. By the eye and erection of the fur, the expression of anger is given. Some birds have the power of erecting their feathers, their crests, or altering the position of their plumage, in token of passion, or for purposes of cleaning their plumes, as when a Pelican emerges from the water; and all character is destroyed by the misapplication of neatness, by too much tying down of feathers, or purposeless stroking of the fur. A test of proper treatment is the setting-up of the neck. Too frequently the neck is quite distorted by the stuffing, and elongated

out of all proportion in the finish. The carriage of the head in nature is of paramount expression. When a bird is dead the muscles of the neck become flaccid, and the neck seems to be longer. This tendency is often aggravated by unskilful treatment of the skin, when serious disproportion may result. For instance, a Duck, sitting on the water, shows but little length of neck; sometimes, when at rest, hardly any; but the same bird in flight shows a long neck. Some knowledge of drawing and of modelling seems to me essential to artistic setting-up of animals; and the best of specimens, inartistically mounted, are relatively worthless.

All the wire used for these operations should be annealed iron wire.

A word of advice. Amateurs are apt, in seeking models, as to pose, action, etc., to choose thoughtlessly. I counsel them never to copy any ordinary "bird-stuffer's" works, and to be very careful how they accept as authorities the pictorial representations in books. If they cannot go to nature direct, in these days of instantaneous photography they can obtain photographic pictures from nature. Instantaneous photographs should be obtained, if possible, of the specimens in life. These may frequently be found in illustrated magazines.

The dried skins of foreign birds must be softened and thoroughly relaxed before being manipulated for setting-up. This is best effected by placing the specimen in a closed box, on wetted white sand, covered by paper, so that the evaporation may penetrate it. The duration of this process must be determined by the size of the bird; one night is sufficient for small skins. The necessary stretching of the shoulders and other folded parts must be effected

carefully, so as to assimilate the specimen to a green skin.

The grouping and "fitting-up," as the ornamentation is technically called, of specimens are important points, careful attention to which greatly enhances their value even in a museum, where such methods are not ordinarily employed. Such addition to the naturalness of the subject often affords opportunity of illustrating by little things the habits and habitat of the animals. To take a Pheasant, for example. Having set up the specimen, if it is intended to cover it by a glass case, a few natural ferns, suitable to the habitat of the bird, should be dried, and the faded colour restored, where necessary, by tinting with oil pigment. Grasses should be treated in the same way. The surface of the structure on which the bird is mounted—or, in other words, the ground—should be formed of calico, tacked tastefully over a wooden framework to assume the required forms. It should then be covered with small pieces of brown paper that have been well soaked and softened in a mixture of glue and whiting. A few loose stones and portions of sand will readily adhere to this surface, and give the required reality of appearance. But it is necessary that these should not be applied until the surface is sufficiently hardened to receive them without being injured. An old root, pieces of lichen, and other objects may be introduced according to taste, so that they be accurately employed. The whole production must be painted with care, wherever painting may be necessary, so as to reproduce naturalness in the greatest perfection; but best of all use natural ground by filling up with suitable material.

It is essential that the plumage of birds should be

quite clean and as perfect as possible before the specimen is mounted. The best way of removing blood stains or other impurities from feathers is as follows:— Dissolve a piece of pure pipeclay, about the size of a walnut, in a short pint of warm water, then with a portion of fine flannel steeped in this liquid, and soaped thoroughly with best yellow soap, saturate and rub the feather the right way; having done this sufficiently, immerse the feather, or the bird-skin, in clear cold water till it is cleansed, then roll it in a dry cloth, which, when duly pressed, will absorb the water. Having done this, hold the specimen within the heat of a fire, all the while beating it briskly and lightly with the folded end of a clean towel. In the case of detached feathers, they can be waved rapidly, or swung round at the end of a string, before the fire. Under this process plumage will resume its proper condition. This is perhaps the most effective as well as simplest operation of the kind, surpassing the employment of spirit and plaster of Paris, salts of sorrel, blue water, etc. Benzoline is, however, very valuable for the purpose. Wipe down the specimen with saturated cotton-wool, away from any light or fire, as benzoline is very volatile, and quickly catches ablaze. Fine dry plaster of Paris may be used for white birds, which must be dusted and beaten till all stains are removed. For some specimens the finest boxwood or mahogany sawdust may be used. Birds with downy feathers should not be treated with sawdust. When using spirits, such as benzoline or turpentine, the specimen will look drenched to start with, but if carefully proceeded with, it can be made to look as well as one that was most carefully attended to when killed.

A method of treating fish trophies may be men-

tioned here as being frequently more convenient, in certain circumstances, than skinning, and at the same time sufficiently efficacious for the purpose. This is to cast the specimen in plaster of Paris; and, whether we care to complete the cast with imitative colouring, or simply to preserve it in white, accuracy of form is at least obtained. A mould must be made. Most fish are more or less covered with a transparent slime, which, for purposes of casting, would obscure the finer external features, such as scales, etc. This coating must be removed. To effect this, lightly sponge the specimen with diluted vitriol, which will have the effect of changing the slime into an opaque film, which can be removed almost like a skin. The fish must then be carefully posed in position, on its side, and all those portions underneath where the plaster would penetrate filled in with clay; this, indeed, should form a bed for the fish, whose fins should be displayed by being impressed into the surface by means of the thumb. The plaster must be carefully prepared: put some water in a vessel and lightly shake the plaster, with the fingers, into it—not pour the water on to the plaster. The first batch should be very thin, but little thicker than milk; it thickens rapidly as it stands. Pour this thin plaster over the specimen—skilfully, so that each portion be well covered, and all the interstices filled with a first film of white. Directly this is set, put on a second coating of thicker plaster, and so on till the mould is thick enough; shape it at last roughly with the fingers. When dry, or rather quite hard, turn the mould over, pick out the clay, take out the fish, and the mould will be fit for use. This is what is called a “waste-mould,” and the reason

will be readily seen. The cast is produced by substituting plaster in place of the fish, thus:—First dip the mould, if space admit of it, into clear cold water, so that the inner surface become thoroughly saturated; or, if the mould be too large to immerse it, wash the inside lightly over with sufficient clay-water, that is, water coloured with modelling clay; the object being by saturation to prevent all absorption on the inner surfaces. If the mould has been preserved till it is dry, an application of boiled oil will have the same effect. The plaster to be inserted must be skilfully mixed, at first quite thin, and washed into the mould so as to fill all interstices, without any bladders or bubbles appearing as this first coating sets. A second coating strengthens the first, and so on; but there is no occasion to make the object solid, although the walls of the cast must in all places be of sufficient thickness. When the plaster is well set hard, the next process is to chip away the mould from the cast, and the mould is therefore called “waste.” This requires skill in the application of sufficient, but not too much strength. It is a convenient resource to put a little tint into the plaster of the mould so that it may be clearly distinguishable from the cast when we come to chip it away. The cast when cleared should present all details of the specimen perfectly. When a number of copies of the cast are required, it is necessary to make a “piece-mould”—a much more complex operation. It is a mould that is made on the object, in pieces that fit perfectly together, and can be removed one by one from the cast, and replaced in position for each cast. It is necessary to make such a mould on a cast, because the yielding nature of the fish would bring about a distortion of parts in a piece-

mould; therefore a waste-mould must be employed in the first operation. The piece-mould exercises the skill of the operator and his judgment. No explanation of the process could teach it so readily as the examination of the thing itself, and an old piece-mould can sometimes be obtained in London which will serve as a guide.

WAX MOULDS can be made quite easily. Any wax will do for the purpose, such as candle, etc., which after the first cost is inexpensive to work, because the wax can be used over and over again. Hot wax should be poured over the specimen, and when set the object removed, and the mould filled with plaster. After the plaster has set, warm the wax and save in a vessel ready for use again. Some make a jelly mould, but without professional assistance this process is difficult.

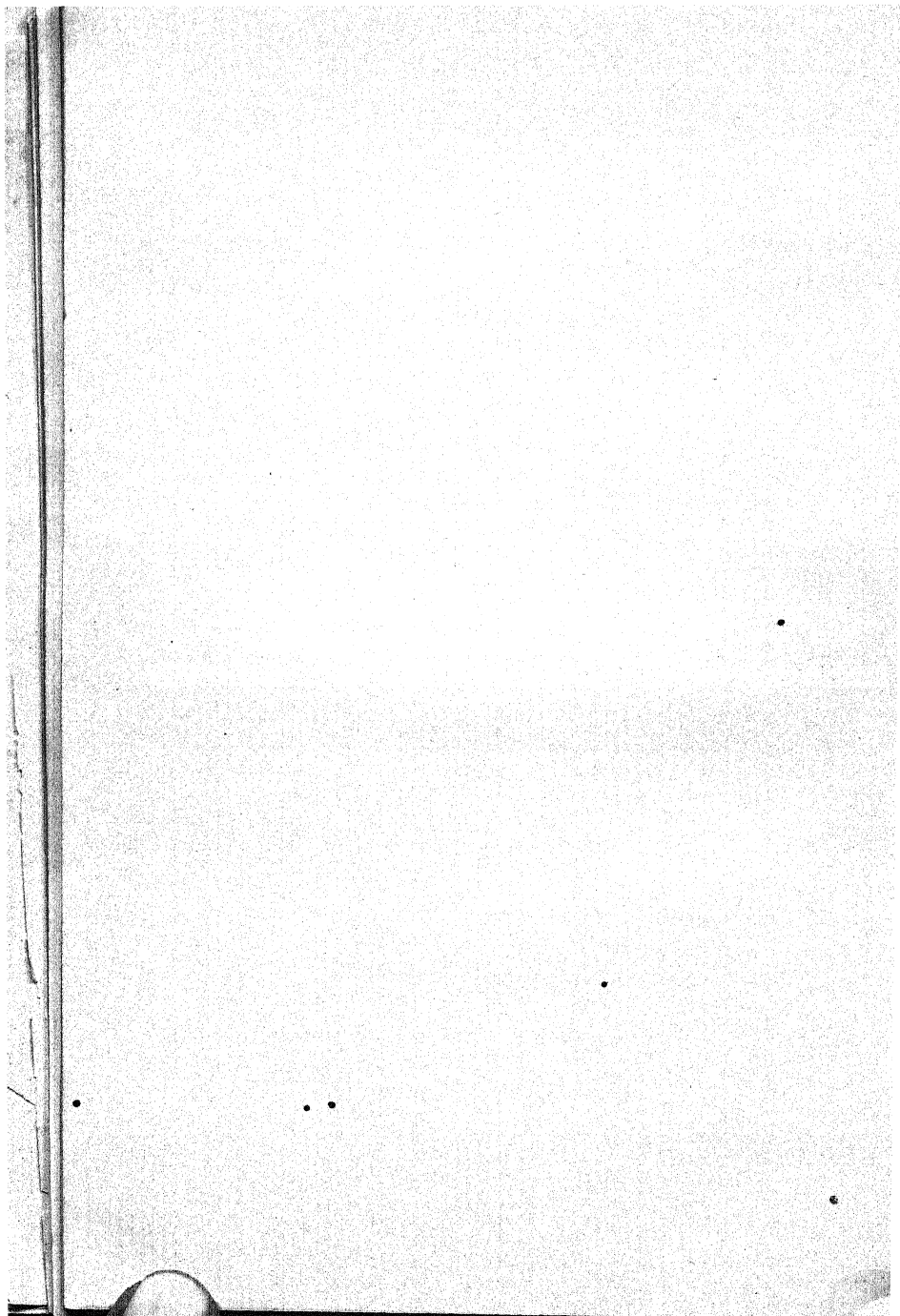
SKIN-DRESSING.—It is a standing difficulty with many sportsmen how best to prepare the skins of animals, so as to make of them the supple and beautiful leather that leaves the hands of the professional furrier, and thus to make the skins available for wearing apparel, rugs, etc., worked according to taste. The right way to proceed is the following:—Let us suppose the subject to be the dried skin of an Indian Leopard. The skin must first be sponged on the flesh side with “liquor” till it is softened, and then properly “shaved.” It should then be partially dried. When in this condition the skin should be folded with the hair inwards, and the edges fastened together with stitches at intervals of about 12 inches. The object of this is, that the operator may subject the flesh side to the action of grease. For a Leopard, about 3 lbs. of lard will be required; this is the proper

grease: butter turns rancid in the skin, and therefore must not be used. The usual mode is to put the skin into a clean tub with the grease, and to tread or knead it with the naked feet, till the action and the natural heat have caused the fat sufficiently and equally to penetrate the fibre of the pelt. The skin may then be laid open and "shaved" a little thinner on the flesh side. The next operation is to clean the fur. To do this, place the skin on a bench with the hair uppermost, and cover it well with fine mahogany dust procured from a veneer mill. Rub this powder with the hand well into the fur, so that it absorbs all the grease, and at the same time cleanses the coat; and after the skin has been sharply beaten with light canes until the dust has all been removed, the natural brilliancy of the specimen will be restored. A process perhaps more convenient to many persons, but not so effectual, is to rub in the grease with the hand.

As the cost of skin-dressing in professional hands seldom exceeds a few shillings, this branch of Taxidermy is very little practised by amateurs.



MODELLED LION'S HEAD, SHOWING EXPRESSION.



HUNTING FIELDS OF THE WORLD

THE following sketch gives a list of the chief hunting fields of the world in which big game can be found, and where interesting or valuable specimens of natural history may be obtained at the same time that sport of the best description may be enjoyed. Within the limits of the space available it would have been absolutely impossible to give complete lists of all the interesting animals found in the different districts, and all that can be attempted is to direct attention to some of the more important of such. While attention has been chiefly bestowed upon animals of sport, and especially big game, mammals or birds remarkable either from their rarity, their peculiar structure, or their beauty and brilliancy of colour have also received special mention. These notes would undoubtedly have been far more useful to the sportsman had it been possible to mention some of the leading features of the species referred to; but this was rendered absolutely impracticable by the limits of space available to the writer. Accordingly, for such details the sportsman or collector must refer to other and larger works.

While treating of all the chief hunting grounds of the world, it has been found advisable to avoid

mentioning for the most part special districts or spots as those in which good sport may be obtained. And this for two reasons: Firstly, because a spot which in one particular season abounds in game may soon after, for some reason or other, become less productive; and, secondly, because that which one sportsman describes as a good hunting ground may not be regarded in the same light by his successor. It is felt that such studied omissions will be much less likely to cause disappointment than if particular localities had been indicated.

The plan adopted in these notes has been to take a general survey of the European countries and their fauna, then to pass on in a similar manner to Asia, from whence the transition is easy to Australasia. Africa is then taken in various sections, with a brief mention of Madagascar; while the notes conclude with a similar survey of the New World, commencing with the north and concluding with the south. The author is fully aware that such a mode of treatment does not accord with the geographical distribution of animals as considered from a purely scientific standpoint, but it is the one which he regards, after mature deliberation, as best suited to the subject in hand.

SOUTHERN AND CENTRAL EUROPE.—Since mountain-ranges are the chief haunts of large game in Europe at the present day, attention may first of all be directed to the three great chains of the Pyrenees, the Alps, and the Caucasus. Different in many respects as are their faunas, these ranges have one feature in common, namely, that they are all inhabited by the Chamois (*Rupicapra tragus*), which is totally unknown in all other parts of the world. The Chamois of each range appears, however, to form a distinct race by itself,

the Pyrenean animal being locally known on the French side as the Izard, and on the Spanish side as Rebeco. The distinctive big game animal of the Pyrenees and other Iberian ranges is, however, the handsome Pyrenean Tur or Ibex (*Capra pyrenaica*), which in some degree serves to connect the Caucasian Tur with the Himalayan Markhor. The other large animals of Spain and Portugal include a variety of the Red Deer (*Cervus elaphus*), the Common Roe (*Capreolus vulgaris*), the Wild Boar (*Sus scrofa*), the Brown Bear (*Ursus arctus*), the Spanish Lynx (*Felis pardina*), the Wolf (*Canis lupus*), and the Fox (*C. vulpes*). Fallow Deer (*Cervus dama*) occur in several parts of the country, but nowhere apparently in a truly wild condition. The birds of Spain are very numerous and well calculated to attract the attention of the sportsman. The Great Bustard (*Otis tarda*) is to be met with on the open lands of the interior, whence its range extends as far eastward, in suitable localities, as Mesopotamia. The Little Bustard (*Otis tetrax*), the Capercaillie (*Tetrao urogallus*), and several other descriptions of Game-birds are likewise to be met with. But the most famous bird-resorts in Spain are the extensive mud-flats of the Guadalquivir, where waders of countless kinds are to be met with, especially during winter, in immense flocks. Among these are Spoonbills, the Purple Heron, Night Herons, and Egrets, together with various kinds of Geese and Ducks. Snipe, too, are abundant in winter on and around the numerous *lagunas* or shallow lakes. Most attractive of all are, however, the flocks of graceful Flamingoes (*Phaenicopterus*) which nest on the open flats of the Guadalquivir, while Pelicans (*Pelecanus onocrotalus*) resort to the reedy swamps. The grandest

of European birds of prey, the Lammergeier (*Gypaëtus barbatus*), which has been completely exterminated from the Swiss Alps, still sails in lordly flight over the upland valleys of the Iberian Peninsula. Eagles, Falcons, Owls, and other birds of prey, as well as numerous species of other groups rarely or never met with in the British Islands, are likewise abundant.

Passing eastwards to the Alps of Switzerland and Italy, these mountains have a special interest to the sportsman as forming the sole habitat of the true or Alpine Ibex (*Capra ibex*), the Steinbok or Bouquetin of the natives. Long since exterminated from the Swiss side, a few herds of this Goat, under Government protection, still survive in certain valleys on the Italian side of Monte Rosa. To shoot any of them a special permit is essential. That graceful ruminant the Chamois, the Gems of the Swiss, is still fairly abundant in many parts of the Alps, notably the Engadine. The natives of the latter district cherish, however, a prejudice against strangers shooting within their borders, so that it is preferable to cross to the Italian side, which may easily be reached from Pontresina.

Italy itself does not appear to be much favoured as a hunting-ground by British sportsmen, probably owing to the fact that big game is scarce, and that in many districts the climate at certain seasons of the year is unhealthy. Excellent wild-fowl shooting is, however, to be had in the marshes during winter, where Snipe also abound. On the other hand, Corsica and Sardinia are celebrated as the home of the European Wild Sheep or Mufion (*Ovis musimon*); and, in common with other Mediterranean countries, they possess the additional advantage of easy access by sea, so that the

sport they offer can be enjoyed during a yachting cruise. September and October are the best months, while Sardinia is the favoured island for Muffon shooting. Both islands are likewise inhabited by a small variety of the Red Deer closely akin to the rather larger race of North Africa, and they also afford Wild Boar shooting. Several kinds of Game-birds are likewise to be met with in these islands, the Barbary Partridge (*Caccabis petrosa*) occurring in Sardinia, while it is replaced in Elba, Corsica, and the Balearic Islands, as well as in North and Central Italy, by the common Red-legged Partridge (*C. rufa*). Formerly the Common Francolin (*Francolinus vulgaris*) inhabited Sicily, where it is now apparently extinct, although still abundant in Cyprus and Asia Minor. The Hoopoe, Roller, Bee-eater (*Merops*), and Golden Oriole are among the more conspicuous bright-coloured birds of these southern lands.

Crossing to the eastern side of the Adriatic and the Ionian Sea, shooting of various descriptions is to be had both on the mainland and on certain of the numerous islands, although there is the disadvantage that in some districts the natives are not always as obliging as they might be, while there may also be the danger of brigands. In the Ionian Islands the Oriental Chukar Partridge (*Caccabis chucar*), which probably also occurs on the Grecian mainland, is first met with. Wild Goats occur in the island of Joura, near Euboea, but some at least of these are the descendants of domestic breeds. In Crete the Persian Wild Goat (*Capra hircus aegagrus*) certainly occurs, and it is also reported from the island of Tavolara, off the north-east corner of Sardinia.

On the mainland Albania is celebrated for the

number and size of its Wild Boars, as it also is for its autumnal and winter flights of Woodcock. The island of Corfu is also renowned for its Woodcock shooting.

Permission to shoot in Albania is, or was, granted by the Turkish Consulate at Corfu, but in 1895-96 some difficulty was experienced in obtaining such permits. It appears, however, according to a writer in *The Field*, that a concession was made that permits to British sportsmen should be issued through the Embassy at Constantinople.

Throughout the Balkans and other mountainous forest districts of Turkey the splendid Maral or Caspian variety of the Red Deer (*Cervus elaphus maral*) abounds.

From the neighbourhood of the Balkans the passage is easy to Transylvania, the Carpathians, and the Tyrol, in all of which districts the above-mentioned race of the Red Deer is to be found. Somewhere, indeed, in the Carpathians this race must apparently pass into the ordinary Red Deer of Western Europe. The Common Roe attains to large dimensions in these districts, where Wild Boar, and, locally, the Brown Bear are to be met with.

Travelling eastwards to the Caucasus, we enter a district containing the finest fauna of large game extant in Europe, and one in which for the first time the sportsman encounters animals of an Oriental type, mingled with others belonging to Eastern Europe, and a few peculiar to this particular area. Although a few years ago almost unknown as a sporting district, the trips of Mr. St. George Littledale, Prince Demidoff, and others have brought the Caucasus and its large

game into prominent notice; and as its distance from London is comparatively slight, it is likely to be still more frequently visited in the near future. The big game of this range include the Caspian Red Deer (*Cervus elaphus maral*), locally known as the Ollen, the Russian term for all deer; and likewise the Common Roe (*Capreolus vulgaris*). In the southern extremity there occurs the Persian Wild Goat (*Capra hircus ægagrus*), while in other parts are found two peculiar species of the same genus. These latter are, firstly, the East Caucasian Tur or Bharal (*C. cylindricornis*); and, secondly, the West Caucasian Tur or Ibex (*C. caucasica*), with more upright and knotted horns. But the noblest of all the Caucasian hoofed animals is undoubtedly the Bison, miscalled Aurochs (*Bos bonasus*), which in this range alone is found in a truly wild and unprotected condition. As already mentioned, the Chamois (*Rupicapra tragus*) is likewise an inhabitant of these mountains. Of Carnivora, the Wolf (*Canis lupus*) and the Brown Bear (*Ursus arctus*) appear to be the most common, the latter species being in some cases of the ordinary brown colour, and in others of a beautiful silver-gray. On its north-eastern flanks the Tiger (*Felis tigris*), probably of the Persian variety, is occasionally seen, while a Leopard (*F. pardus tulliana*) is far from uncommon among the higher rocks; and the northern Lynx (*F. lynx*) is a comparatively common animal. Small Carnivora, such as Foxes and Badgers, are of course abundant, as are also Hares. Of the Game-birds the most interesting are the Caucasian Black Grouse (*Lyrurus mlokotzievici*) and the Caucasian Snowcock or Snow Partridge (*Tetraogallus caucasicus*), the latter being represented by a closely allied species (*T. caspius*) in the Caspian district, and by a third in the

Himalaya. At lower levels are found the common *Perdix cinerea* and Red-legged Partridges.

RUSSIA.—Of Russia north of the Caucasus a brief notice will suffice, firstly, for the reason that the country is by no means easy of access to British sportsmen, and, secondly, because the fauna of its western districts approximates to that of the Scandinavian peninsula, while that of the eastern provinces is more or less of a Central Asian type. The great prize in Russian shooting is, of course, the Bison (*Bos bonasus*) of the forest of Bielowitza, or Biolvitskia, in the government of Grodno, the ancient Lithuania. The animals in this tract are strictly preserved, and are indeed in a state bordering on domestication, and permission to shoot them is very rarely granted to British sportsmen. Although specifically the same as the Caucasian race, the Bielowitza Bison (or Aurochs, as it is generally miscalled) presents certain differences from the former, doubtless attributable to long isolation. In the Kazan district, on the south-western flanks of the Urals, the Reindeer (*Rangifer tarandus*) extends as far south as latitude 54° N., and on the opposite side of that range, in the Kirghiz steppes of Asiatic Russia, two degrees still farther southward. In suitable localities the Elk (*Alces malchis*) is found to the northward of the fiftieth parallel, its range extending eastwards right across Asia to Amurland. Red Deer (*Cervus elaphus*) are also widely spread over Russia, as is the Roe (*Capreolus vulgaris*), represented on the eastern side of the Urals by the larger Siberian *C. pygargus*. In the trans-Volga districts of South-east European Russia occurs that remarkable Antelope the Saiga (*Saiga tatarica*), whose headquarters are, however, the Kirghiz steppes of Asiatic Russia. The

peculiarly puffy nose and down-turned nostrils are the most striking features of the Saiga, the male of which alone bears horns of an amber colour and heavily ringed. The Brown Bear and the Wolf are both common animals in Russia, where the Lynx, Fox, Otter, Sable, and other fur-bearing mammals also occur. There are likewise several species of Eagles and other raptorial birds not met with in Western Europe, while the Urals are the habitat of a variety of the Common Capercaillie (*Tetrao urogallus uralensis*). Sand-Grouse are found on the plains of the Volga district, and still more abundantly on the Kirghiz steppes of Asiatic Russia.

SCANDINAVIA AND LAPLAND.—Both geographically and zoologically Lapland forms a connecting link between Central Russia and Scandinavia, on the fauna of which attention may now be concentrated for a few moments. And here it may be incidentally mentioned that in Denmark the larger Carnivora are exterminated, and it is not till we enter Norway and Sweden that such formidable animals as Bears are encountered. Both these latter countries are favourite resorts of the sportsman, not only on account of the numerous kinds of large and small game to be obtained there, but also from their easy accessibility from Britain, the general healthiness of the climate, certain facilities of transit, and the beauty and varied character of the scenery. The backbone of mountains running along its western side, the numerous fjords on the same coast, and the vast forests covering a large portion of its area, render the peninsula a safe retreat for numerous large mammals, as well as for raptorial and game birds and hosts of water-fowl. The whole country,

and especially Lapland, is, indeed, the breeding-ground for a vast number of birds which journey northwards in spring from the warmer parts of Europe, where they have wintered.

Here it may be noted that on private estates in the peninsula the sportsman has only to get the permission of the owner to shoot (for which, however, payment is usually demanded), no license being requisite. On the other hand, for permission to shoot or fish on Crown lands a license must be obtained. Both in the rivers and in the fjords the fishing is excellent; and so good is the salmon-fishing that many of the best rivers are leased to English sportsmen. Since the ground in most districts is covered with snow for seven months in the year, the sporting season is chiefly in the summer and autumn. In past times the whole of the country* was infested and overrun with beasts of prey, but these have been to a great extent driven back to the forests and mountains of the northern provinces, where they are still comparatively abundant. The continuous incursions of sportsmen from abroad cannot, however, do otherwise than tell on the numbers of the game, and certain localities are becoming more or less shot out. Where Bears and Wolves are sufficiently numerous to inflict serious damage on the flocks and herds, the peasants periodically organise large hunts or drives, and likewise resort to several ingenious systems of trapping and snaring.

The largest, and in some respects the most formidable, of the Scandinavian Carnivora, the Brown Bear (*Ursus arctus*), is now seldom found save in Dalecarlia and the northern provinces. Many speci-

mens attain a great size and weight, some weighing as much as four or even five hundredweight, and it is believed that they continue to grow till about their twentieth year. Wolves, Badgers, and Foxes are to be met with everywhere, the valuable black variety of the latter occasionally occurring. Of more northern types, the ravenous Glutton, or Wolverine (*Gulo luscus*), whose skin has a considerable commercial value, is now and then killed in the forests of Dalecarlia, and is more common in those of Finmark and Lapland. In these northern districts the sportsman may likewise meet with the Arctic Fox (*Canis lagopus*), either in the blue or the white coat. Other Carnivora are the northern Lynx (*Felis lynx*), the Otter (*Lutra vulgaris*), the Pine-Marten (*Mustela martes*), and smaller forms like the Polecat, Stoat or Ermine, and Weasel. Certain parts of Norway are among the last resorts of the European Beaver (*Castor fiber*), but these animals are now very properly protected by special laws.

In possessing all the five species of Deer indigenous to Europe, the Scandinavian peninsula occupies a unique position. One of these, however, the Fallow Deer (*Cervus dama*), is not known to occur in the wild state. The other four are the Red Deer (*C. elaphus*), of which this region possesses the typical form, the Roe (*Capreolus vulgaris*), the Elk (*Alces malchis*), and the Reindeer (*Rangifer tarandus*). Of these, the Elk, which is the largest existing member of the *Cervidæ*, has completely disappeared from the province of Scania, where it was once abundant; but in some other districts, where it is protected, its numbers have decidedly increased. •Mr. J. H. Thomas informs me that the shooting-season for

Elk extends from 1st September to 31st September or 15th October; each district has, however, its own regulations, and in certain cases it seems that the time may be extended to 31st October. Full details are annually given in the local almanacs. From these it will be seen that in some districts Elk-hunting with dogs is forbidden for one or more years. By the natives Elk are hunted in two fashions, an Eskimo dog in leash being employed in Norway, but in Sweden a lighter breed of dog is allowed to range freely in search of its quarry. Whereas Elk are essentially forest-dwelling animals, Reindeer in the wild condition are inhabitants of the open high fjeld of the peninsula, especially in the Dalecarlian and Koelen mountains. Although considerable herds are still to be met with in certain districts, the size of these bears no comparison to those described by sportsmen of half a century ago. The Reindeer and its American varieties the Caribou are the only members of the Deer tribe in which antlers are normally developed in both sexes.

Turning to birds, we may mention among the raptorial species the Golden Eagle (*Aquila chrysaëtus*) and the Great Horned Owl (*Bubo maximus*), which are to be found in suitable districts throughout the country; while in the extreme north and Lapland occur the Great Lapp Owl (*Syrnium lapponicum*) and the beautiful Snowy Owl (*Nyctea scandiaca*). On the lowlands of Sweden, where it was formerly numerous, the Great Bustard (*Otis tarda*) still lingers. Game-birds are remarkably numerous both in species and individuals. Foremost in point of size is the Capercaillie or Capercailzie (*Tetrao urogallus*), which in the south attains a weight of 16 lbs., or even more, and is to

be met with in all the pine-woods, and more especially those of the hilly districts. Still more abundant is the Black Grouse (*Lyrurus tetrix*), while the Hazel Hen (*Tetrastes bonasia*) inhabits the woods and hills of the more northern districts. Of the true Grouse there are two representatives, namely, the Willow Grouse, or Dal Ripa (*Lagopus albus*), chiefly inhabiting the northern forest districts and the islands, and the Common Ptarmigan, or Fjäll Ripa (*L. mutus*), which frequents the high stony table-lands and rocks above the limit of tree-growth and heaths. Several of the above-mentioned species of Game-birds will interbreed, some of the hybrids being comparatively common, while others must be regarded in the light of rarities. The Common Partridge (*Perdix cinerea*) is also an inhabitant of the peninsula, although nowhere abundant; while the Common Quail (*Coturnix communis*) in some seasons makes its appearance in considerable numbers in Norway, but is always rare in Sweden. Woodcock, although sometimes arriving in considerable flights on the western coast during the spring and autumn, are generally scarce, and are yearly becoming more so. Snipe of various kinds frequent the low grounds. Water-birds abound on the lakes, rivers, and fjords; and fine shooting of this description may be had in almost any part of the country, although it is apparently best at Nordholm. The belt of islands, or Skärgård, is also an excellent situation for this kind of sport. Among Norwegian Water-fowl the following are some of the most abundant or notable:—Swans (*Cygnus*), Geese (*Anser*), Wild Duck (*Anas boschas*), Teal (*Querquedula crecca*), Widgeon (*Mareca penelope*), Tufted Duck (*Fuligula cristata*), Golden-eye (*Clangula glaucion*), Long-tailed Duck (*Harelda glacialis*), Common

Eider (*Somateria mollissima*), King Eider (*S. spectabilis*), and Steller's Eider (*S. stelleri*). Of the three species of Eider the first is common all along the western coast, but the second is only a winter visitor to the peninsula, where it does not breed, while the third, although very rare, nests on the Varanger-fjord. Two other members of the Duck tribe, the Ruddy Merganser (*Mergus serrator*) and Goosander (*M. merganser*), are also worthy of mention. In addition to these are the Black-throated and Red-throated Divers (*Colymbus arcticus* and *septentrionalis*); while that splendid bird the Great Crested Grebe (*Podiceps cristatus*), although a rare visitor to Norway, breeds in Southern Sweden and Denmark, as it also does on both shores of the Baltic. Gulls and Terns of various species are of course numerous on all the tidal waters.

To those interested in Whales it may be mentioned, that a station for the capture of these creatures has been established near Hammerfest, and a second on the Varanger-fjord, the species most commonly taken being the Humpback (*Megaptera boöps*) and Rudolphi's Rorqual (*Balenoptera borealis*). Seals, too, frequent the coasts in some numbers.

ARCTIC EUROPE AND ASIA.—Although, strictly speaking, there is but a single circumpolar province, the animals of Arctic America being closely allied to, or identical with, those inhabiting the extreme north of Asia and Europe, it is more convenient in a work of the present nature to treat the two areas separately. And since Northern Scandinavia and Lapland lie well within the Arctic circle, we are naturally led from these to the countries still farther north. On the ice-bound coasts of Spitzbergen, and more especially in the neighbourhood of Diana Bay and the Thousand

Islands on the southern side, sport of a peculiar and exciting nature may be obtained with comparative ease, although the country is not generally accessible before July. In addition to several species of true seals, such as the Gray Seal (*Halichærus grypus*), Crested Seal (*Cystophora cristata*), and Ringed Seal (*Phoca barbata*), the Atlantic Walrus (*Odobænus rosmarus*) is to be reckoned among the prizes of the sportsman. It is true that its tusks are not so large as those of its Pacific relative, but they form quite unique trophies.

I have been favoured with the following notes on Arctic shooting by Mr. W. Livingstone Learmonth:—"Leaving on one side the Arctic Right Whale, which affords, I think, the finest sport in the world, but the chase of which scarcely comes within the range of the amateur, I pass to relatively minor animals such as the Polar Bear and Walrus. I cannot call the Polar Bear (*Ursus maritimus*) a sporting animal; I have only seen two show fight out of a very large number shot. Walrus, if hunted as the Eskimo hunt them—that is with a hand-harpoon and a *drogue* (inflated seal-skin) afford magnificent sport. When hunted with a rifle, they require very accurate shooting, as if merely wounded, they only die later on. No finer field for big game shooting than the Arctic exists. For Polar Bear the Spitzbergen or Franz-Josef-land seas should be chosen; while for Walrus, Franz-Josef-land, or, on the American side, Baffin Bay and Lancaster Sound, offer the best possibilities. The best rifle for Arctic shooting is the 500 Express, the 'bottle-shell' cartridge of which contains 130 grains of black powder, while the bullet weighs one ounce. For Walrus the bullet should be hardened with antimony

to penetrate the thick skull; and although I have had no opportunity of testing it, I believe that the new service rifle, with its great penetration, would prove an efficient weapon for Walrus, although useless for Bear."

In order to obtain the magnificent spiral tusk of the male Narwhal (*Monodon monoceros*)—for this curious Cetacean seldom develops more than one—special hunting arrangements must be made with the natives.

Throughout the Arctic regions of the Old World Reindeer occur wherever sufficient nutriment is obtainable; and Arctic Foxes likewise extend to the most northern habitable land. The birds of the Arctic regions include those mentioned above under the head of Scandinavia, together with many others. To enumerate these would far exceed the limits of my space, but it may be mentioned that the Spitzbergen Ptarmigan, (*Lagopus hyperboreus*) is perfectly distinct from both the Scandinavian species, being distinguishable at a glance by the greater amount of white on the base of the tail-feathers at all seasons of the year. In habits also it is different from the Norwegian species, and is an excellent bird for the table.

KAMCHATKA.—Although Walruses are unknown beyond the valley of the Yenisei, the majority of the Arctic animals of the Old World continue their range eastwards to the neighbourhood of Bering Strait. Apparently somewhere to the eastward of the Yenisei the habitat of the Kamschatkan Big-horn (*Ovis canadensis nivicola*) commences, although its western limits are still unknown. This fine sheep certainly inhabits the countries bordering the Sea of Okhotsk and the peninsula of Kamschatka; the latter country, where the Sheep are found close to the shore, being com-

paratively easy of access to the sportsman desirous of adding their horns to his trophies. Kamschatka is also the abode of a huge variety of the Brown Bear (*Ursus arctus collaris*) nearly allied to some of the Alaskan representatives of the species. The valuable Sable (*Mustela zibellina*) is also procurable in Kamschatka, as also in Siberia; while the Kurile Islands, which connect the peninsula with Japan, are the hunting grounds for the Sea-otter (*Lutra lutris*), whose skin may be worth any price between £40 and £100, or even considerably more. Game-birds are also abundant, the largest being the Kamschatkan Capercaillie (*Tetrao camschaticus*), a near relative of the Siberian *T. parvirostris*. The rivers, too, at certain seasons of the year are absolutely packed with salmon, mostly belonging to the genus *Oncorhynchus*.

• MANCHURIA AND NORTHERN ASIA.—Although the Japanese islands are inhabited by a small species of Deer (*Cervus sika*) and two kinds of Bear, as well as by Sömmerring's Pheasant (*Phasianus sömmerringi*) and other Game-birds, they appear to be little known as hunting grounds, and I may accordingly pass to Amurland and Manchuria on the mainland, and thence into Central Asia north of Tibet and China proper. As a hunting ground the great characteristic of this vast area is the number of varieties of large Deer and Sheep by which it is inhabited, whose antlers and horns afford some of the most magnificent trophies the sportsman can desire. Much of the country is, however, extremely difficult of access, and many parts are still more or less completely unknown to the British sportsman. Amurland and Northern Manchuria, especially the neighbourhood of the Ussuri River, are chiefly notable as being the habitat of the

Manchurian Wapiti (*Cervus canadensis luehdorfi*), locally known as the Isubra, and a near relative of the West American Wapiti. On the other hand, in Southern Manchuria the Duke of Bedford's Deer (*C. xanthopygus*), a species with many Wapiti-like features, but with antlers approaching the Red Deer type, may be looked for. Here, too, is found the Manchurian Roe (*Capreolus manchuricus*), a near relative of the larger Siberian species (*C. pygargus*), so common in the Altai. The Manchurian Sika (*Cervus sika manchuricus*), a larger relative of the Japanese Deer, also inhabits these districts. In the Ussuri valley, and perhaps also in Corea, occurs the handsome Pekin Sika (*C. hortulorum*), so named from having been first described from specimens taken at the sack of the summer palace near that city. Amurland is within the habitat of the long-haired Siberian Tiger (*Felis tigris longipilis*), which probably has a wide range in Northern and Central Asia. A very large Leopard (*F. pardus fontanicri*), as well as a Brown Bear more or less nearly allied to the Kamchatkan race, must, judging from the number of skins exported from China, be common in parts of Manchuria and Northern Mongolia.

In the latter country is found the most easterly representative, *Ovis ammon jubata*, or Mongolian Argali, of the great Argali Sheep of Central Asia, although nothing is known of this particular race in a state of nature. The Mongolian or Gobi desert is the habitat of a species of Gazelle (*Gazella gutturosa*) which takes its common name from the country, and is characterised by a peculiar swelling of the wind-pipe.

On the western and north-western sides of the

Mongolian desert tract the Altai and Thian Shan ranges, as well as the adjacent districts, afford a great variety of large Sheep and Deer. From the Sair and Jair Mountains to the north-east of Kuldja, Mr. St. George Littledale has procured a Sheep which has been named *Ovis sairensis*; in the Altai itself occurs the true Argali (*O. ammon typica*), perhaps the finest of all the wild Sheep; while the Pamirs are the home of Marco Polo's Sheep (*O. poli*), which bears the palm for length of horn. A variety of this latter (*O. poli karelini*) inhabits the Ala-tau, to the north of Lake Issik Kul, and apparently also the Thian Shan range. Of the Deer family the Altai and Thian Shan ranges contain one of the finest representatives in the form of the Altai Wapiti (*Cervus canadensis asiaticus*), whose antlers are larger in proportion to the size of the body than in the ordinary American Wapiti. The Siberian Roe (*Capreolus pygargus*), a much larger animal than the European species, with rougher antlers, much more hairy ears, and more white on the rump, and likewise the Musk Deer (*Moschus moschiferus*), are common in both the ranges mentioned above. That handsome Goat the Siberian Ibex (*Capra sibirica*) is also found in the same mountains, as well as in several of those of Siberia, while to the southward its habitat extends into Baltistan. With regard to the Altai Wapiti, Mr. H. J. Elwes writes that "this species has now become scarce in a wild state in the Russian Altai owing to the number which are shot by the natives and Russian hunters, who sell their horns, if killed while in the velvet, at high prices to the Chinese. They are, however, kept alive in parks at several places in the Altai for the sake of their horns. . . .

The killing of these deer has now been prohibited by the Government in the Altai district."

The Yarkand Gazelle (*Gazella subgutturosa yarkandensis*), a variety of the Persian Gazelle distinguished by its large size and comparatively short horns, is also found in the Altai and Thian Shan, as well as on the plains of Maralbashi, on the Kashgar tributary of the Yarkand River. The latter locality is also the haunt of a variety of the Hangul, or Kashmir Stag (*Cervus cashmiranus yarkandensis*); while in parts of Russian Turkestan is found a species of Deer (*Cervus bactrianus*) nearly related to the Shou of the districts north of Bhutan. Wild Bactrian Camels are found in the neighbourhood of Kashgar, but these appear to be the descendants of domesticated individuals. Of course there are many other species of animals, both furred and feathered, well worthy of the attention of the sportsman in these extensive regions, but to mention them would be impossible, and those above cited are the most important.

It may be added that in many parts of Central Asia Sand-Grouse are abundant, Pallas's Sand-Grouse (*Syrrhaptes paradoxus*) ranging in summer as far north as Lake Baikal. Game-birds of various descriptions are of course to be met with throughout these districts. Special mention may be made of the Bearded Partridge (*Perdix daurica*), distinguished from the common species by its paler and grayer colour, and the elongation of the feathers of the chin and neck into a kind of beard. It inhabits the greater portion of North-Eastern and Central Asia, extending from the Thian Shan to Amurland and Manchuria. On the Amu Daria is found Severtzoff's Pheasant (*Phasianus chrysomelas*), while Shaw's Pheasant (*P. shawi*) inhabits Yarkand

and Kashgar. Farther north, along the Sir Daria, and thence through Turkestan to the Black Irtish, we find the Mongolian species (*P. mongolicus*), and still more eastward, in Dzungaria, the nearly allied *P. semitorquatus*.

Of the Saiga Antelope, so abundant on the Kirghiz steppes, mention has been already made under the head of European Russia.

ASIA MINOR, CYPRUS, AND PERSIA.—The mountainous districts of Asia Minor and Persia are the home of the Wild Goat, or Pasang (*Capra hircus ægagrus*); and in the former country access to shooting grounds can be obtained either from Smyrna on the west, or from Trebizond through Erzerum on the north. Anatolia and the Erzerum district of Armenia are also celebrated as the haunts of the Asiatic Mufion, or Armenian Sheep (*Ovis orientalis*), a smaller race of which (*O. orientalis ophion*) inhabits the Troödos Mountains in the interior of Cyprus. Throughout the forest districts of Asia Minor, as well as in the Caspian provinces of Persia, the Maral, or Caspian Red Deer (*Cervus elaphus maral*) is a well-known animal; and Roe are also found in Northern Persia. On the other hand, the Persian Fallow Deer (*Cervus mesopotamicus*) is found in Mesopotamian Persia, at the head of the Persian Gulf, one well-known locality being the province of Luristan. The antlers of this species are markedly different from those of the ordinary Fallow Deer. Another ruminant found in Persia is the Urial, or Guch, forming a variety of the Shapu (*Ovis vignei*), which may prove to be distinct from the one inhabiting the Punjab Salt Range, as well as from the Baluchi race. The above-mentioned Asiatic Mufion also extends into Northern Persia.

Gazelles are represented by the true Persian Gazelle (*Gazella subgutturosa typica*), which, although smaller than the Yarkand race mentioned above, yet has absolutely longer horns, as well as by a variety of the Common Indian *Gazella bennetti*. Wild Boar (*Sus seroфа*) are everywhere abundant, but nowhere more so than in the oak-forests of Shiraz and Mesopotamia. In the latter district they afford food to numerous Lions (*Felis leo*), which especially affect the west flanks of the Zagros Mountains east of the Tigris valley, as well as the wooded ranges south and south-east of Shiraz, but are unknown in Southern Persia and Baluchistan. A small variety of the Tiger (*Felis tigris*) is restricted to the Caspian provinces of Northern Persia, and there is also a small-spotted and thick-tailed variety of the Leopard (*F. pardus tulliana*) which approximates in appearance to the Ounce. Smaller cats are not uncommon, while the Hunting Leopard (*Cynælurus jubatus*) is met with in certain districts, and the Long-tailed Red Lynx or Caracal (*Felis caracal*) in the Mesopotamian provinces. Wolves, Jackals, and Foxes of various kinds range all over the country, and the pale-coloured Syrian Brown Bear (*Ursus arctus syriacus*) is found from South-Western Persia through the Shiraz district and Mesopotamia to the head of the Mediterranean in Syria. The Gur-khar, or Persian race of the Asiatic Wild Ass (*Equus hemionus hemippus*), extends from Syria through Mesopotamia and Persia to Baluchistan.

The Birds of Asia Minor and Persia are numerous, and to a considerable extent intermediate between those inhabiting Southern Europe and those of India. The raptorial species include Vultures and Eagles of several kinds, the Lammergeier, and the Peregrine

and other Falcons. Sand-Grouse are common on the open plains of Persia and Baluchistan, while the Common Pheasant (*Phasianus colchicus*) abounds in the forests of the Caspian provinces. The Common Partridge (*Perdix cinerea*) extends as far east as Asia Minor and Northern Persia, and the Common Francolin, or Black Partridge of Indian sportsmen (*Francolinus vulgaris*), which also inhabits Cyprus, is met with in Palestine, Asia Minor, and the whole of Persia, whence it extends through Baluchistan to India. The Indian Gray Partridge, or Francolin (*F. pondicerianus*), replaces the ordinary Partridge in the south of Persia, and the oriental Bonham's Sisi Partridge (*Ammoperdix bonhami*) is found as far east as the Euphrates valley. The Chukar (*Caccabis chucar*), which seems to be only a variety of the Rock Red-legged Partridge (*C. saxatilis*), is likewise common in Persia; and the Caspian Snow-Cock (*Tetraogallus caspius*) inhabits the mountains of Asia Minor and the higher ranges near Shiraz. Quail (*Coturnix communis*) are abundant in all the cultivated fields while the crops are green, but in winter leave the Persian highlands for India. On the numerous rivers and lakes wading-birds and water-fowl are numerous, among them being Flamingoes, Wild Duck, Teal, Pintail, Widgeon, Pochards, Scoters, Golden-eye, Shel-drake, Geese, and Swans, the latter being especially abundant on the Caspian during winter. Woodcock haunt the rose-gardens of Persia, and three kinds of Snipe visit the country in winter. The Great Bustard appears to be an occasional visitor to Northern Persia; the Little Bustard (*Otis tetrax*), common in the countries to the west of the Caspian, has been obtained near Tehran; and Macqueen's Bustard

(*Hubara macqueeni*) is the common species of Persia, being a summer visitant to the plateau, where it breeds.

BALUCHISTAN AND AFGHANISTAN.—These small countries, both geographically and zoologically, serve to connect Persia with the Punjab and Sind, having few, if any, absolutely peculiar animals. For this reason, coupled with the circumstance that Afghanistan is practically a closed country to English sportsmen, a very short notice must suffice. Urial (*Ovis vignei*) are found throughout the hilly districts of both countries, but whereas the Baluchistan form (*O. vignei blanfordi*) seems to indicate a distinct race, the one from Afghanistan appears inseparable from the Salt-range variety. Two races of the straight-horned type of Markhor inhabit Afghanistan, namely the Cabul Markhor (*Capra falconeri megaceros*), with wider horns, and the Suliman Markhor (*C. falconeri jerdoni*), in which the horns form an absolutely straight spiral. The latter variety is obtainable from the Punjab side of the Suliman range in the neighbourhood of the stations of Dera Gazi Khan and Banu. A variety of the Wild Goat (*C. hircus blythi*) inhabits Baluchistan and the adjacent districts of Sind.

KASHMIR AND ADJACENT TERRITORIES.—Thirty or forty years ago, and in certain districts to a much later period, the territories under the rule of the Maharaja of Kashmir, which include Jamu, Punch, Kashmir, Baltistan, and Ladak, were a perfect paradise for sportsmen. But, partly owing to legitimate sport, and still more to less defensible methods of destruction, the game has been so reduced that several species a few years ago were in danger of extermination. Happily, things have changed for

the better by the introduction of forest-laws, which it is hoped will do much towards replenishing the stock of large game, although it is very doubtful if this will ever be equal to what it was even twenty years ago. The Maharaja's territories comprise countries presenting very different types of fauna, according to their elevation above the sea-level and whether they lie within or beyond the influence of the Indian monsoon. The outer ranges of the Himalaya, in the districts of Jammu and Poonch, have, for instance, a fauna approximating more or less closely to that of the Punjab; while more northern Asiatic types come in as we reach the high ranges of the Pir-Panjal and Kailash and the vale of Kashmir on their northern side. On the other hand, after crossing the snowy range forming the northern barrier of the Kashmir valley, the sportsman enters an arid and almost rainless district with a fauna and flora of the Tibetan type. The Jammu and Baltistan districts, which obtain a certain amount of moisture by way of the Indus valley, are, however, less arid than Ladak, and accordingly exhibit a less marked approximation to the typical Tibetan fauna.

For such portions of the Himalaya as lie within the influence of the monsoon, March, April, May, and the first half of June are the most favourable months for big-game shooting; the second half of June, July, and August being in general so rainy that no sport is to be obtained. From the beginning of September to the close of November the weather, as a rule, is perfect, but the vegetation is rank. These are the months for Pheasant-shooting. December, January, and February are cold, with much snow at all elevations over 7000 feet. The

Himalaya beyond the action of the monsoon may be visited comfortably at all seasons of the year, unless the way be barred by snow.

In the valley of Kashmir, January and February, if the snow is deep, are excellent for Deer shooting; and March is a good time to get fine Stags, which then come low down to graze on the fresh grass. The latter half of April, the whole of May, and the early part of June form the proper season for Markhor and Ibex. From the middle of June to the middle of September little can be done in the valleys adjacent to Kashmir, all the animals being then able to wander over the mountain-tops, which are then clear of snow, while the Bears are out of fur and their coats valueless. These months, on the other hand, are the season for Ladak and Baltistan. Between the middle of September and the beginning of November the Stags are calling and returning from their summer retreats to lower levels, while the Bears of both species begin to be worth shooting. Chukar, too, are at this season to be found on the lower hills.

During November and December a great drawback to shooting is found in the condition of the grass, which at this season is dry, slippery, and consequently wiry under the tread of the sportsman. The Bears also are hibernating. An early snowfall will, however, remedy the first evil, and will likewise cause the Stags to descend. On the Walar Lake of Kashmir Wild-fowl are excessively numerous, but from being constantly harassed by the native boatmen, will not allow a boat to approach.

The number of kinds of game animals, fur and feathered, occurring within the limits of Kashmir territory is so large, that to mention all would be

impossible, while creatures of other descriptions must, to a great extent, be ignored. In the outer hills many of the animals met with are common to the plains of India, and these, for the most part, are accordingly not referred to here, attention being concentrated on those peculiar to the country and other parts of the Himalaya.

In the forest districts of the outer Himalaya and the lower parts of the valley of Kashmir the Himalayan Black Bear (*Ursus torquatus*) is a well-known animal, whose range extends westwards to the confines of Persia. The Himalayan Serow (*Nemorhædus bubalinus*) and the smaller Goral (*Urotragus goral*) are also inhabitants of this zone. Here, too, is the home of that short-horned goat the Tahr (*Hemitragus jemlaicus*), whose range extends from the flanks of the Pir-Panjal range to Sikhim. At and above elevations of about 8000 feet, the Musk Deer (*Moschus moschiferus*) is to be met with throughout the extent of the Himalaya, while northwards this animal ranges, in suitable localities, through Central Asia into Siberia. The Pir-Panjal and Kajmag ranges form the south-easterly limits of the habitat of the Markhor, which appears to be bounded to the east by the Chinab valley. The variety inhabiting the two ranges in question is known as *Capra falconeri cashmiriensis*. In Astor and Baltistan this race is replaced by *C. falconeri typica*, in which the horns form a still more open spiral. This race extends to Gilgit, where a writer in *The Field* for 12th June 1897 gives the following account of Markhor shooting in the previous year:—

“The season for Markhor usually begins about Dec. 20, when the males, under the impulse of the rut, come down from the retreats where they have been in

solitary hiding, and join the herd in the lower parts of the hills. By 'hills' should be understood mountains which may be anything from 15,000 ft. to 25,000 ft. high, but the word has taken too deep a root in India to be readily dropped. The rut last season commenced later than usual, and I do not think a Markhor was shot before Christmas Day. However, between that date and March 31 no fewer than fifty-two Markhor carrying horns of 40 in. and over were bagged in the Gilgit district alone, not including Astor, and of these nine carried horns of 50 in. and over. The finest head measured 55 in., which is not likely to be beaten now that Kashmir game has been so shot down of late."

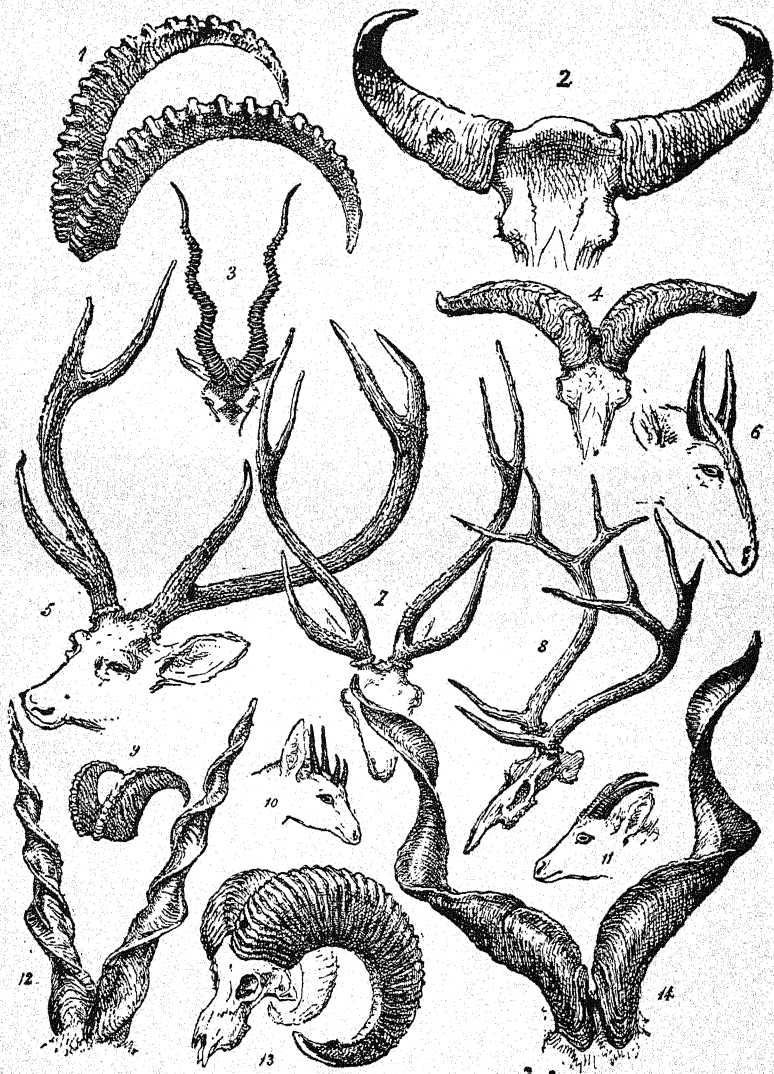
The Kashmir race of the Hangul (*Cervus cashmirianus*), commonly known as the Barasingha, and a near relative of the European Red Deer, is restricted to the valley of Kashmir and the districts immediately adjacent, although, as mentioned above, it reappears in the form of a variety in Eastern Turkestan. Far to the south-west, in the districts north of Bhutan, it is replaced by a far larger and finer species, the Shou (*C. affinis*). The higher mountains of Kashmir and the districts to the north are the home of the Himalayan Brown Bear, or Snow Bear (*Ursus arctus isabellinus*), a race which extends as far west as Astor and Gilgit, and eastwards to Nepal, but is unknown in Suru, Zaskar, and Ladak. A pale variety of the Lynx (*Felis lynx isabellina*) ranges from Gilgit through Baltistan to Ladak; and the beautiful Ounce, or Snow Leopard (*Felis uncia*), is found throughout the arid districts, ranging from the Altai to Tibet. The ordinary Leopard, which is not uncommon in Kashmir, does not in all probability range beyond the forest districts. Wild Dogs are found alike in the forests and on the



INDIA

1. Asiatic Ibex. *Capra sibirica*.
2. Gaur, or Indian Bison. *Bos gaurus*.
3. Blackbuck or Indian Antelope. *Antilope cervicapra*.
4. Barhal. *Ovis nahuia*.
5. Sambar. *Cervus unicolor*.
6. Nilgai. *Boselaphus tragocamelus*.
7. Chital. *Cervus axis*.
8. Swamp Deer. *Cervus duvauceli*.
9. Tahr, or Jharal. *Hemitragus jemlaicus*.
10. Four-horned Antelope. *Tetracerus quadricornis*.
11. Serow. *Nemorhædus bubalinus*.
12. Suliman Markhor. *Capra falconeri jerdoni*.
13. Tibetan Argali. *Ovis ammon hodgsoni*.
14. Cabul Markhor. *Capra falconeri megaceros*.

* * * For Measurements of Horns, Weights of Big Game, and other Statistical Information, see *Records of Big Game*, by Rowland Ward, F.Z.S. One vol. Illustrated. Price 30s. net.



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open plains of Ladak, and in all situations are most cordially detested by the sportsman on account of disturbing or destroying his game. Wolves abound in certain districts, and in Ladak there is a black variety of the Tibet Wolf (*Canis lupus laniger*), whose thick fur forms decidedly handsome rugs.

Reverting to horned game, the Astor district, where it is known as Urin, is the home of the typical race of *Ovis vignei*, but in Ladak the same species of Sheep bears the name of Sha, or Shapu. From near Shigar, in Baltistan, and westwards to Tibet and northwards to the Kuen-lun and Altyn Tagh, is found, at high elevations, one of the most characteristic of Tibetan ruminants, the Blue Sheep, or Bharal (*Ovis nahura*), whose smooth horns are so unlike the other Asiatic members of the same genus. Incomparably the finest of all the sheep found within these territories is, however, the Tibetan Argali (*Ovis ammon hodgsoni*), which is still to be met with in Changchenmo and the other more remote districts of Ladak. In these desolate regions the sportsman is indeed in the very midst of the typical Tibetan fauna, among which the following other species may be mentioned. First and foremost the Yak, or Phong (*Bos grunniens*), whose horns form the blue ribbon of the sportsman in these districts. Changchenmo is the headquarters for Yak-shooting, but these magnificent ruminants are yearly becoming scarcer within Kashmir territory, although abundant enough in Tibet proper. Eastwards their range extends to the Kuen-lun and Kansu. Although much smaller, an equally striking and equally characteristic Tibetan ruminant is the Chiru, or Tibet Antelope (*Pantholops hodgsoni*), which has much the same range as the Yak, and whose long horns form some of the most graceful of all sporting

trophies obtainable in Asia. Far smaller and much more curved are those of the Goa, or Tibetan Gazelle (*Gazella picticaudata*), which also inhabits the same districts. The Kiang, or typical race of the Asiatic Wild Ass (*Equus hemionus*), likewise abounds in Eastern Ladak, whence it extends into Tibet.

The Asiatic Ibex (*Capra sibirica*), although abundant in Baltistan, is unknown in the greater part of Ladak, as it is in Tibet proper. In the ranges north of the Kashmir valley it is represented by a variety (*C. sibirica sacin*), which extends along the Himalaya about as far as the Ganges valley. There are, however, no Ibex on the Pir-Panjal and the Kajnag ranges.

Regarding the smaller mammals met with in Kashmir territory, a few words must suffice. Hares, chiefly of the species *Lepus oiostolus*, are exceedingly abundant in the higher districts of Ladak, wherever low bush occurs in sufficient quantity to afford them cover. Marmots occur on the summits of the range to the north of the Kashmir valley, and thence throughout Ladak and Baltistan at high elevations. Their fur, although highly coloured, is too short and stiff to be of much use. The beautiful Indian Marten (*Mustela flavigula*) is not to be met with beyond the forest districts. In the latter, even at elevations where snow rests for a considerable portion of the year, two large species of Monkey occur, one a Langur (*Semnopithecus*), and the other a Macaque (*Macacus*). Flying Squirrels are abundant wherever there are trees.

As regards feathered game, the forest districts of Kashmir territory, although far less rich in the Pheasant tribe than those farther to the east, have

much to attract the sportsman. Most splendid of all is undoubtedly the Monal (*Lophophorus refulgens*), whose range extends from Eastern Afghanistan to Western Bhutan, in elevated forests. Sand-Grouse are represented in Eastern Ladak by *Syrrhaptes tibetanus*, which is still more common in Tibet. Grouse and Ptarmigan are unknown, but the Snow Partridge (*Lerua nivicola*) inhabits the crests of the higher ranges, which are also the home of the Tibetan Snow-Cock (*Tetraogallus tibetanus*). Chukar (*Caccabis chucar*) are to be found throughout the territory, from the forest-clad outer hills to the desolate deserts of Ladak. Hodgson's Partridge (*Perdix hodgsoniae*) occurs sparingly in Kashmir and parts of Ladak; and Quail-shooting may be had in the middle and outer hills about the time the maize is cut. These latter ranges, from Hazara to Nepal, are likewise inhabited by the White-crested Kalij Pheasant (*Gennæus albocristatus*); while in Chamba we enter the range of the Common Koklass (*Pucrasia macrolopha*). In many of the wooded valleys fair Woodcock-shooting is to be obtained at certain times of the year. In Ladak Blue Rock-Pigeons are extraordinarily abundant, and afford good shooting for the pot. The abundance of Water-fowl on the Walar Lake has been already mentioned; and here is to be found the beautiful Water-Pheasant, or Jacana (*Hydrophasianus*). Kingfishers, some blue and others pied, are to be seen on every river; while the Long-tailed Paradise Flycatcher, as well as Long-tailed Magpies, cannot fail to attract attention in the forest districts of the outer hills. Birds-of-prey are numerous, Ospreys (*Pandion*) being frequently seen in the river valleys.

Lastly, mention must be made of Mahseer-fishing,

a sport which may be enjoyed either in the outer hills, especially in the Punch district, or in the Jhelam within the valley of Kashmir itself.

TIBET.—Since Tibet is practically a closed country to British sportsmen, a short notice of its animals will suffice, more especially as many of these have already been referred to under the head of Ladak. It should, however, be mentioned that Eastern Tibet, in the neighbourhood of Moupin, possesses a fauna somewhat different from that of the districts west of Lhasa. Of the few English sportsmen who have in recent years succeeded in penetrating into Tibet, Mr. St. George Littledale, starting from England in 1894, managed to get within 40 miles of Lhasa. He had, however, to abandon most of his natural history specimens, together with other baggage. More fortunate was Dr. Thorold, who succeeded in bringing to London the only examples of the Lhasa Stag, or Thorold's Deer, which have hitherto reached this country. Yak, Chiru, Goa, the Tibetan Argali, and the Kiang have been already referred to as inhabitants of the Tibet plateau. In addition to these, Thorold's Deer, (*Cervus albirostris*), an aberrant member of the Red Deer group, is found near Lhasa, probably among forests; while from Moupin has been obtained the Little Tibetan Tufted Deer (*Elaphodus cephalophus*). Here, too, occurs the remarkable Great Panda (*Ailuropus melanoleucus*), which was long regarded as a relative of the Bears. Like many other Tibetan animals, it ranges into Kansu and Sze-chuen, where specimens have recently been obtained by Mr. F. W. Styan. Bears are represented by the small Blue Tibetan species (*Ursus pruinosis*), easily recognised by the large amount of white mingled with its coloration.

At least one species of Goral (*Urotragus*) inhabits Eastern Tibet, where there is also found a Takin (*Budorcas*), perhaps specifically or sub-specifically distinct from the animal inhabiting the Mishmi Hills. Very peculiar are the two large species of Snub-nosed Monkeys (*Rhinopithecus*), which are near relatives of the Asiatic Langurs, but differ by the short and up-turned nose. A species of Macaque (*Macacus*) likewise inhabits Eastern Tibet.

CHINA AND FORMOSA.—As a shooting-country comparatively little is heard of China proper, although parts of it abound with some of the most splendid members of the Pheasant tribe. The fauna of its north-western provinces (Kansu and Sze-chuen) approximates more or less to that of Tibet; whereas in Yun-nan animals of a Burmese and Siamese type are met with. Many species of Deer are reputed to inhabit China, but this arises from several having been kept in confinement in the imperial park, Pekin. Among these, the Pekin Sika has been already mentioned (p. 118) as a native of Manchuria. Of the Milou, or Père David's Deer (*Elaphurus davidianus*), the real habitat is unknown; and since the herd formerly in the imperial park is stated to have escaped and been destroyed, it is possible that the few specimens at present in captivity in Europe may be the sole survivors of the species. In the Yang-tsi valley is found the hornless Chinese Water-Deer (*Hydrelaphus inermis*); while there are several species of Muntjac (*Cervulus*) inhabiting China, the most remarkable being the Hairy-fronted Muntjac (*C. erivifrons*), from the neighbourhood of Ningpo. In the latter district is also found a cousin of the Muntjacs in the shape of Michie's Tufted Deer

(*Elaphodus michianus*). A large variety of the Sambar inhabits Sze-chuen, and a second (*C. unicolor swinhoei*) Formosa. The last-named island has also a species of Sika Deer (*C. taiwanus*); while the island of Hainan possesses a variety of the Thameng (*C. eldi platyceros*). Tigers and Leopards are to be met with in various parts of China, and Formosa is inhabited by a Bear.

Passing on to birds, mention may be made of a species of Blood-Pheasant (*Ithagenes*) from the western provinces of China, represented by an allied form in Tibet. The beautiful Horned Pheasants (*Tragopan*) occur in several parts of the country, as well as a Monal (*Lophophorus lhuysii*) in the western districts. Hodgson's Eared Pheasant (*Crossoptilum tibetanicum*) is likewise found in Western China and Tibet; and the lovely Silver Pheasant (*Gennæus nycthemerus*) is an inhabitant of the southern principalities. True Pheasants (*Phasianus*) are represented by the white-ringed bird now so common in English coverts; while the Nan-Shan range possesses a second species (*P. satscheuensis*), and Formosa a third (*P. formosanus*). Other members of the genus are Elliot's Pheasant (*P. ellioti*) from the mountains of the north-east, and Reeves's Pheasant (*P. reevesi*) from the northern districts; the Golden and Amherst's Pheasants (*Chrysolophus pictus* and *amherstiae*) inhabiting the mountains of Eastern Tibet and the west and south of China. To mention the other species of Game-birds as well as of Waterfowl inhabiting China would altogether exceed my limits of space; and it must suffice to say that Quail and Snipe are abundant in suitable districts, while Ducks swarm on the waters. Among the latter group the lovely Mandarin Duck (*Aix galericula*) must, however, claim notice.

INDIA.—As a field for sport India can lay claim to a front place among the dependencies of the British Empire; and in many districts such sport is obtainable with less difficulty, and under conditions of greater comfort, than in most parts of the world. With proper introductions, the means and appliances of sport can be obtained in all the game-producing districts, and the traditional hospitalities of the East enjoyed. The number of British sportsmen and travellers who now visit India is, however, so large that it is practically impossible for all to be entertained in the old-fashioned hearty way. To do so would entail too severe a tax, both on the native princes and on the British civil servants holding high positions.

The sporting animals of this country, together with Tibet and Burma, are described in the *Great and Small Game of India, etc.*: Rowland Ward, 1900.

Having already treated of Kashmir and the Gilgit district above (p. 124) as well as Baluchistan and Afghanistan, Sind and the Punjab will form the limits of the area to the north-west; while to the north-east the main chain of the Himalaya to the southward of Tibet, and the valley of Assam in the extreme east, will form our boundaries. This immense area, even excluding the higher Himalaya, presents an enormous variation of climate and physical conditions, the dry plains of the Punjab and Rajputana being as unlike the teeming moist forests of the Terai of Bhutan and Nepal as it is possible to conceive. The elevated plateau of the Deccan, again, is totally different in all respects from the low swamps of the Bengal Sandarbans. To a great extent these different areas have more or less distinct faunas, but since a number of animals are common to a large portion of

the whole of India, it would entail much repetition to treat of the country entirely according to districts. Hence the following notes refer in some cases to the faunas of particular districts, and in others to the animals alone.

The north-western portion of India is inhabited by several animals properly belonging to the Himalayan and Central Asian fauna. On the eastern flanks of the Suliman range there occurs, for example, the Suliman Markhor (*Capra falconeri jerdoni*), while a variety of the Wild Goat (*C. hircus blythi*) inhabits the hills of Sind. Again, in the Salt Range of the Punjab, as well as in the Attock Hills, we find the true Urial (*Ovis vignei cycloceros*). Wild Asses also inhabit the deserts of Sind and Cutch. Goral and Serow, as well as Tahr and Musk-Deer, are to be met on the southern side of the main Himalayan axis to the south-eastward of Tibet; but there are no Markhor, and Ibex are not met with east of the Satlej valley. Probably, however, in the Nepal districts a few Bharal are to be found to the south of the snowy range. The occurrence of that magnificent stag the Shou (*Cervus affinis*) somewhere between the northern districts of Bhutan and Lhasa, has been already referred to. The Mishmi Hills, within sight of the Assam valley, are inhabited by the curious Takin (*Budorcas taxicolor*), whose horns recall those of the White-tailed Gnu; but this animal does not appear to have been ever killed by English sportsmen. The Terai, or moist tropical forest district of Bhutan and Nepal, is the habitat of several animals unknown in other parts of India, although some of them range into Burma and the Malay countries. Among these are the beautifully coloured Cat-Bear, or Panda (*Ursus fulgens*) and the

funereal-looking Binturong (*Arctictis binturong*), remarkable for the prehensile nature of its long tail. The curious Hog-Badger (*Arctonyx collaris*) as well as the Brown Ferret-Badger (*Helictis orientalis*) are likewise denizens of the base of the Eastern Himalaya.



FROM THE TROPHY OF COOCH BEHAR. ROWLAND WARD, F.Z.S., fecit.

Here, too, occurs the handsome Clouded Leopard (*Felis nebulosa*), which is really a Malayan animal, as also the beautifully spotted and lithe Linsang (*Linsanga pardicolor*). The Hulock Gibbon (*Hylobates huloc*) enters India in the hill-ranges south of Assam. But the grandest animal of this district is the great Indian Rhinoceros (*R. unicornis*), which is now almost restricted to the Assam plain, rarely, if ever, occurring

to the west of the Tista river, although formerly extending into the Punjab. The Sumatran Rhinoceros (*R. sumatrensis*) extends into Assam from the countries to the east. The Pigmy Hog (*Sus salvanius*) is confined to the Terai of Bhutan, Sikhim, and Nepal. From Nepal to Gilgit, and thence into Kashmir, occurs a variety of the Common Fox (*Canis vulpes montanus*), while the European Wolf (*C. lupus*) enters the Punjab.

Turning to birds, it is noteworthy that, in addition to Kashmir territory, the Sub-Himalayan and Terai area is the only part of India where members of the Pheasant tribe, other than Peacock and Jungle-fowl, are met with, although *Phasianus* itself is absent. One species of Peacock-Pheasant (*Polyplectrum*) extends from Assam to Sikhim; and the Chir Pheasant (*Catreus wallichii*) is found from Nepal to Chamba, while the Koklass (*Pucrasia macrolopha*) ranges from the former districts to Kashmir. Three species of Kalij Pheasant (*Gennaeus*) also occur in the Eastern Himalaya; the Monal (*Lophophorus refulgens*) frequents the higher ranges, and the gorgeous Tragopans or Horned Pheasants (*Tragopan*) are to be met with throughout the area. The Blood-Pheasant (*Ithagene cruentus*) inhabits the pine-forests of Nepal, Sikhim, and Bhutan, while the rare Mountain-Quail (*Ophrysia superciliosa*) has been shot at Mussuri and Naini-Tal. In Assam the sportsman may shoot the shy Bamboo-Partridge (*Bambusicola fitchii*), as well as Hill-Partridges (*Arboricola*) which are common to the Sub-Himalaya and the Malay countries. Chukar (*Caccabis chukar*) extend as far east as Nepal, but are not met south of the Punjab and Sub-Himalaya. The Salt Range and some other hills in the Punjab are the habitat of the Sisi Partridge (*Amimoperdix bonhami*). Although the Black-

bellied (*Pterocles arenarius*) and large Pin-tailed Sand-Grouse (*Pteroclorus alchata*) straggle as far south as Delhi and Lucknow, they are found more abundantly in the dry plains of Cutch, Sind, and the Punjab. On the other hand, the Common Sand-Grouse (*Pteroclorus caustus*) has a much more extensive range, being met with in numbers in the Deccan and North-west Provinces. The Little Bustard (*Ovis tetrax*) only enters India in the North-western Punjab, although other Bustards extend to the south.

With these remarks on groups more or less confined to the north-west and northern districts, attention may now be directed to other Indian animals, which will be taken in zoological order. As regards Monkeys, it will suffice to say that both the Macaques (*Macacus*) and Langurs are chiefly or exclusively Oriental animals, being unrepresented in Africa south of the Sahara. Of the sleepy-looking Lorises, one species (*Nycticebus tardigradus*) extends from Assam to the Malay countries, while the second is found in the forests of Southern India and Ceylon.

• India, it is almost unnecessary to observe, is a great country for large Carnivora. In addition to the Tiger (*Felis tigris*), of which the typical race is found throughout the country, the Lion (*F. leo*), although now rare, is represented in Guzerat and other districts of the north-west; while the Leopard, or Panther (*F. pardus*), is ubiquitous. Among smaller species are the Marbled (*F. marmorata*), Fishing (*F. viverrina*), Leopard (*F. bengalensis*), and Jungle (*F. chaus*) Cats. Although everywhere rare, the red Caracal (*F. caracal*) occurs in most districts except the Malabar coast: while the Hunting-Leopard (*Cynaelurus jubatus*) has a wide range, although

unknown in the extreme south. Civets (*Viverra*) and Palm-Civets (*Paradoxurus*) occur wherever there are trees; and the species of Mongoose (*Herpestes*) are to be met with all over the country. That skulking brute the Striped Hyæna (*H. striata*), although seldom seen, likewise wanders all over the country; the Jackal-like Indian Wolf (*Canis pallipes*) replaces the European species south of the Punjab, while Jackals themselves (*C. aureus*) are everywhere to the fore. Equally wide in its distribution is the Indian Wild Dog (*C. deccanensis*); and small Foxes (*C. bengalensis* and *leucopus*) inhabit the more open or desert districts. Omitting Martens and Weasels, mention may be made of the Indian Ratel (*Mellivora ratel*), the Indian variety of the Common Otter (*Lutra vulgaris nair*), and the small Clawless Otter (*L. leptonyx*). One of the most characteristic of all Indian Carnivora is the well-known Sloth-Bear (*Melursus ursinus*), which is peculiar to the country, where it is to be met with everywhere.

To mention the host of Bats, Insect-eating, and Rodent mammals of India, is quite beyond my limits, but it may be said that Fruit-Bats, or Flying-Foxes (*Pteropus*), are everywhere abundant, and that three species of Hare occur on the plains. Turning to large game other than Carnivora, the Indian Elephant (*Elephas indicus*) naturally claims first mention. At the present day this magnificent beast, in a wild state, is found along the base of the Himalaya as far as Dehra Dun, as well as locally in the forest country between the Ganges and Kistna, as far west as Bilaspur and Mandla, in the Western Ghats as far north as lat. 17° or 18°, and in some of the forest-clad parts of Mysore and the districts still farther

south. Two of the species of *Rhinoceros* occurring in India have been already mentioned; the third is the Javan *Rhinoceros* (*R. sondaicus*), which is found from Assam to the Sandarbans and certain other parts of Eastern Bengal. Of the *Bovidae*, the



INDIAN BUFFALO. TROPHY OF COCH BEHAR. ROWLAND WARD, F.Z.S., fecit.

Gaur, commonly miscalled Bison (*Bos gaurus*), frequents Assam and all the great forest-tracts of the peninsula; while the Buffalo (*B. bubalis*) is found wild on the plains of the Ganges and Brahmaputra, from Assam to Rohilcund, as well as those of Orissa and the Eastern Central Provinces. The only representative of the Sheep and Goats in peninsular India is the Nilgiri Tahr, or Ibex (*Hemitragus hylocrius*),

found alike in the Nilgiris and the Anamalais; and we come next to the Nilgai, or Bluebull (*Boselaphus tragocamelus*), an extremely characteristic Indian animal, ranging over the country from the foot of the Himalaya to the south of Mysore. Quite as characteristic and as widely spread is the Four-horned Antelope (*Tetraceros quadricornis*), while the Blackbuck (*Antelope cervicapra*) is found in suitable situations throughout the country. On the other hand, the Indian Gazelle, the Ravine Deer of sportsmen (*Gazella bennetti*), is restricted in India to the plains and low hills of the north-western and central districts. The Common Muntjac or Barking Deer (*Cervulus muntjac*) occurs in all wooded hills, even to a considerable elevation in the Himalaya; its place on the plains being taken by the Hog-Deer (*Cervus porcinus*). From Assam and the Himalaya to the Narbada and Godaveri, the Swamp-Deer, or Barasingha (*C. duvauceli*), may be looked for in suitable localities; while the noble Sambar (*C. unicolor*) is to be found in almost every part of the



WILD BOAR FROM COCH BEHAN.

country except the dry plains of the Punjab, Sind, and Rajputana. The beautiful Indian Spotted Deer or Chital (*C. axis*), is likewise to be met with almost throughout the country. The elegant Indian Chevrotain, or Mouse-Deer (*Tragulius meminna*), is found in the hill-forests of Southern India, extending

northwards to Orissa, Chutia Nagpur, and the Eastern Central Provinces, as well as in the Western Ghats. Lastly, we have the Indian Wild Boar (*Sus cristatus*), which is distributed throughout the country, although never shot by sportsmen in any district where it can be speared on horseback. Scaly Ant-eaters, or Pangolins (*Manis*), although rarely seen, are widely distributed in India.

Of Game-birds other than these referred to above as characteristic of the Sub-Himalayan districts, the following may be mentioned:—First and foremost we have the Peacock (*Pavo cristatus*) throughout the country; but as this bird is held sacred by the Hindus, the sportsman, if he wishes to avoid getting into trouble, must be careful where he shoots it. From the outer Himalaya to the Godaveri valley, and westward to Raipur and Mandla, the Red Jungle-fowl (*Gallus ferrugineus*), is a common bird; but in Southern and Western India it is replaced by the Gray Jungle-fowl (*G. sonnerati*), a species abundant in the Narbada valley. At the foot of the Himalaya in Oudh, as well as in many forest-districts south of the Indo-Gangetic plain, the sportsman will encounter the Red Spur-fowl (*Galloperdix spadicea*); while south of the Ganges and in Southern Bombay and Madras he will find the Painted Spur-fowl (*G. lunulata*). Common in Bengal, the Blue-headed Quail (*Ercaefactoria chinensis*) occurs locally in many other districts; while the Common Quail (*Coturnix communis*) is a winter visitor all over the country, where the Rain-Quail (*C. coromandelica*) is a permanent resident. The two species of Bush-Quail (*Perdicula*) are peculiar to the Indian peninsula, where two species of Painted Bush-Quail (*Microperdix*) are also met

with locally, the third species inhabiting Assam and Manipur. A better known bird is the handsome Black Partridge, or Francolin (*Francolinus vulgaris*), which affords such excellent sport from a howda in the Ganges khadir. The southern limits of this bird run from North Khatiawar and the south of Cutch through Gwalior and Sambalpur to Orissa; to the south of this line its place being taken by the Painted Partridge (*F. pictus*). The common Gray Partridge or Francolin (*F. pondicerianus*) is a widely distributed bird, although unknown in Lower Bengal and some other eastern districts, as well as in parts of Bombay. The Three-toed Quails (*Turnix*), one species of which is commonly known as the Bustard-Quail, while the others are termed Button-Quail, are likewise familiar Indian birds.

Although unknown in Bengal, Chutia Nagpur, and Behar, the Great Indian Bustard (*Eupodotis edwardsi*) frequents the open plains of most parts of the country; but the Indian Hubara (*H. macqueeni*) is only a winter visitor to the north-western districts. Some of the most esteemed of Indian Game-birds are the Bengal and the Lesser Florican (*Sypheotis bengalensis* and *aurita*). Apart from smaller species, Ibises, Spoonbills, Storks (especially the huge and ungainly "Adjutant," which visits Bengal during the rains), Wood-Ibises, Herons, Night-Herons, Egrets, or "Paddy-birds," and Flamingoes, are among the most familiar of Indian birds; but to mention any of these in detail is barred by want of space. The same remark applies to the hosts of Water-fowl which visit India in the cold season, and a few of which are resident. It must accordingly suffice to say that, inclusive of Swans, Geese, and Mergansers, no less

than thirty-eight distinct species of this group are admitted by Mr. Blanford into the list of Indian birds. Besides Ducks and Geese, the plains of India are invaded each autumn by flights of Snipe, most of which remain for the winter and afford excellent sport; the marshes, or jhils, in the neighbourhood of Calcutta being famous for their Snipe. The species usually met with are the Common Snipe (*Gallinago caelestis*), the Pintail (*G. stenara*), and the Jack Snipe (*G. gallinula*); the Himalayan Solitary Snipe (*G. solitaria*) being confined to the range from which it takes its name. The beautiful Painted Snipe (*Rostratula capensis*), which, from its slow flight, affords but poor sport, is, on the other hand, a permanent resident in the plains. Woodcock, which breed in the high Himalaya, migrate in winter to the hills of Southern India, and during their journey may occasionally be met with in the plains. In the season, Woodcock-shooting is one of the principal sports of the Nilgiris. Excellent Snipe-shooting may also be obtained during the winter on these hills; and as the sportsman is travelling to or from his ground, he may pick up a stray Spur-fowl, or a Painted Quail. Indian birds can scarcely be dismissed without mention of the beautiful Purple Water-hens (*Porphyrio*), which form such conspicuous objects around every lake and pool.

For those who care for such creatures, the Indian rivers offer a fine selection of Crocodiles; since, in addition to a couple of species of ordinary short-nosed "Magars," the Ganges and certain other rivers are tenanted by the long-nosed Garial (*Garialis gangeticus*). Although generally feeding on fish, this species occasionally devours human bodies. The Gangetic

Dolphin (*Platanista gangetica*), locally known as Susu, is likewise a characteristic denizen of the mighty river from which it takes its name.

CEYLON.—The fauna of Ceylon is essentially a poor edition of that of Southern India, many of the larger Indian animals—notably the Tiger—being absent. Among the species indigenous to the island, the Asiatic Elephant, although less numerous than formerly, is abundant in the hill-forests; but unfortunately the Singalese race has almost always only rudimentary tusks. Wild Buffalo are numerous in the northern and eastern districts; but Gaur, at least at the present day, are absent. Sambar, commonly called Elk by English sportsmen, abound in the mountains, as do Chital and Muntjac in all the forests of the interior. The Sloth-Bear and the Leopard are the two largest Singalese Carnivora, black specimens of the latter being occasionally seen. Langurs inhabit the lowland forests, and the Toque Macaque (*Macacus pileatus*), though nearly allied to a South Indian species, is peculiar to the island. Game-birds are not numerous; the Peacock inhabits the whole island, as does the Ceylon Jungle-fowl (*Gallus lafayetti*), but the Ceylon Spur-fowl (*Galloperdix bicalcarata*), which is likewise restricted to the island, is absent from the dry northern districts. Neither of the two Indian species of true Quail (*Coturnix*) occurs, although the Jungle Bush-Quail (*Perdica asiatica*) visits the northern districts. Himalayan types of Game-birds are of course absent.

BURMA, SIAM, AND THE MALAY PENINSULA.—Under this heading may be included all the countries of the Asiatic mainland lying to the south-east of Assam and to the south of China; Munipur and Tenasserim, as well as Anam and Tonkin, consequently coming within

the area. Whereas those portions of this vast tropical or sub-tropical tract which come under the sphere of influence of the British Government are more or less easy of access, Tonkin and Anam are more difficult for the English sportsman. Although intimately connected with the fauna of India by that of Assam, a large number of the Burmese and Malayan animals are restricted to the countries east of the Bay of Bengal, the peculiarly Malayan element increasing as we travel southwards.

Gibbons, as well as Langurs and Macaques, represent the Monkey tribe throughout the area. Of the larger Carnivora, the Tiger and Leopard are likewise universally present, while the Clouded Leopard is a characteristic species. There are also several smaller Cats, as well as Civets (*Viverra*), Palm-Civets (*Paradoxurus*), and Mongoose (*Herpestes*). The Burmese Linsang (*Linsanga maculosa*) is peculiar to these countries, as is practically the small-toothed Palm-Civet (*Arctogale leucotis*); while the Binturong occurs throughout. Hyænas, Wolves, and Foxes are unknown, but Jackals and the Malay Wild Dog (*Canis rutilans*) abound. Very characteristic are the small Ferret Badgers (*Helictis*); and among the *Ursidae* the Himalayan Black Bear extends as far south as Pegu, where it comes well within the range of the little Malay Bear (*Ursus malayanus*). Of the Insect-eating Mammals, Tree-Shrews (*Tupaia*) are abundant, and the curious Gymnura (*G. rafflesii*), an animal something like a large long-nosed Rat, extends as far north as Tenasserim. One Hare (*Lepus peguensis*) is found in Burma; and throughout the region the burrowing Bamboo Rats (*Rhizomys*) are common. Brush-tailed Porcupines (*Atherura*) are also distinctive of the area.

The Asiatic Elephant, as well as the Javan and the Sumatran Rhinoceros, are found everywhere, and the Malay Tapir (*Tapirus indicus*) ranges as far north as Tenasserim. The Gaur, locally known as the Sladang, inhabits all the forest hill-tracts, and wild Gayal (*Bos frontalis*) have been reported from Tenasserim. The characteristic Bovine of this area is, however, the Banting, of which a light-coloured variety (*B. sondaicus birmanicus*) inhabits Burma, and may extend to Manipur, although additional specimens from the latter locality are required to determine whether they form a distinct race. Buffaloes also occur, but whether indigenous is not certain; the only other Ruminant being the Burmese Serow (*Nemorhædus sumatrensis*). Of the Deer tribe the area under consideration has several peculiar forms. Firstly, we have the rare Schomburgk's Deer (*Cervus schomburgki*) of Siam, at present represented in English collections solely by the antlers; next, the Thameng, or Eld's Deer (*C. eldi*), extending southwards from Manipur; and thirdly, the Malayan Sambar (*C. unicolor equinus*), found as far north as Assam and Kachar. The Hog-Deer ranges throughout Burma, as does the Indian Muntjac, or a variety thereof, while the rare Tenasserim Muntjac (*Cervulus fææ*) has been obtained in the district from which it takes its name. Chevrotains of two species (*Tragulus javanicus* and *napu*) inhabit the Malay Peninsula, and the Indian Wild Boar extends into Burma.

Birds attain a great development in the moist forests of the area under consideration. Among Game-birds, the Peacocks are represented by the Burmese species (*Pavo muticus*); the gorgeous Argus Pheasant (*Argusianus argus*) is met with in Tenasserim,

Siam, and the Malay Peninsula, while the rare Reinhard's Argus (*Reinhardius ocellatus*) frequents the mountain-forests of Tonkin. Two species of Peacock-Pheasants (*Polyplectrum*), the miscalled Argus of sportsmen, are also found, one (*P. bicalcaratum*) being peculiar to the southern provinces of the area. While these birds will rise to the gun, the true Argus, which is an extremely wary bird, runs and skulks among the trees so that it is generally captured by means of the snare. Three species of the beautiful Fire-backed Pheasants (*Lophura*) are found, although only one of these (*L. rufa*) ranges into British Burma. The Red Jungle-fowl is common everywhere; and the Kalij group is represented by the Burmese Silver Pheasant (*Gennæus lineatus*) in Burma and North-west Siam, and by Anderson's Silver Pheasant (*G. andersoni*) in Yun-nan. Bamboo Partridges (*Bambusicola*) and Wood-Quails (*Rollulus* and *Excalfactoria*) may be included among the smaller Game-birds; while the Common Quail is a rare visitor, and the Rain-Quail a resident. Bush-Quails (*Microperdix*) and Hill-Partridges (*Arboricola*), as well as species of the allied genera *Tropicoperdix* and *Caloperdix*, may likewise be found amongst a "mixed bag." Francolins (*Francolinus*) are less abundant than in India, but Button-Quail (*Turnix*) are numerous, one species (*T. blanfordi*) being almost restricted to the area. Snipe and Water-fowl of various kinds are to be met with in large numbers during the cold season. Of other groups it must suffice to say that the beautiful Eastern Trogons (*Har-pactes*) may be sought in the densest woods, and that specimens of the Gapers (*Cymborhynchus*) and Barbets (*Chotothea*) should be carefully preserved when obtained. Hornbills are likewise very characteristic birds.

ISLANDS OF THE MALAY OR INDIAN ARCHIPELAGO.—Although visited but seldom by British sportsmen, the great islands of the Malay Archipelago contain a fauna allied in most respects to that of the Malay Peninsula, but containing a certain number of peculiar types, and as we proceed eastward gradually approximating to that of New Guinea and Australia. Since few realise the real size of many of these islands, it may be mentioned that Borneo is more than double the area of Great Britain, while Sumatra is as large as the entire home empire, and Java as extensive as Ireland. In these three islands many of the Mammals and Birds are specifically identical with those inhabiting the mainland. Among such may be mentioned the Elephant (unknown in Java), the two smaller species of Asiatic Rhinoceros, the Tiger and Leopard, and in Sumatra, the Malay Tapir. Other Carnivora are the Clouded Leopard, the Flat-headed Cat (*Felis planiceps*), the Bay Cat (*Felis temmincki*), and the Malay Bear. Quite peculiar is the small sub-aquatic Carnivore known as *Cynogale bennetti*. But even more striking among the animals of these islands are the Orang-Utan, or Mias (*Simia satyrus*), which is confined to Sumatra and Borneo, and the grotesque-looking Proboscis Monkey (*Nasalis larvatus*), of the island last named. The typical black race of the Banting appears to inhabit all three islands, and there are many peculiar Deer in these and the neighbouring islands. Among these latter the Burmese Sambar is met with in Borneo, and may also occur in Sumatra; the Luzon Sambar (*C. unicolor philippinus*) is a smaller form from Luzon, in the Philippine group, while the still smaller Basilan Sambar (*C. unicolor nigricans*) inhabits the island of that name in the same group.

A much finer animal is the Rusa Deer (*C. hippelaphus*) of Java, races of which also inhabit the Moluccas and Timor. The Spotted Philippine Deer (*C. alfredi*) and the Calamianes Deer (*C. culonensis*) also come from islands of the Philippine group; while the little Bavian Deer (*C. kuhli*) takes its name from certain small islands lying between Borneo and Java. Muntjacs are common in the islands just mentioned as well as in Sumatra, and appear indistinguishable from the Indian species. Chevrotains are likewise numerous. Borneo possesses a dwarf race of the Indian Buffalo, which appears to be a truly wild animal. Wild Pigs are likewise found in most, if not all of the islands of the archipelago, and are all more or less distinct from the Indian species; among them being *Sus verrucosus* and *S. vittatus*, and the long-snouted *S. barbatus* of Borneo. Among the smaller mammals especial attention may be directed to the numerous Tree-Shrews and Squirrels, some of the latter being remarkable for their brilliant coloration. Pangolins are also met with.

• The Birds are of the same general type as those inhabiting the Malay Peninsula, although there are, of course, many peculiar species. In the mountains of Western Sumatra occurs the rare Black Fire-backed Pheasant (*Acomus inornatus*); while the Lesser Argus (*Argusianus grayi*) is peculiar to Borneo, where also occurs the gorgeous Bulwer's Pheasant (*Lobiphasis bulweri*), conspicuous for its blue wattles, as well as the rare Schleiermacher's Peacock-Pheasant (*Polyplectrum schleiermacheri*). Java is especially notable for the beauty of its birds and insects. Here reappears the Burmese Peacock, which is unknown in the other islands, and likewise

the handsome Nicobar Pigeon (*Caloenas nicobarica*), conspicuous for the long bronzy hackles of the neck. The Red Jungle-fowl and the rare Green Jungle-fowl (*Gallus varius*) are also found in the island. Among other remarkable or brilliantly plumaged birds may be mentioned a fine Hornbill (*Buceros sylvestris*); the Yellow and Green Trogon (*Harpalarpactes reinwardti*), representing a genus peculiar to Java and Sumatra; a superbly coloured Flycatcher (*Pericrotus miniatus*); and the Black and Crimson Oriole (*Oriolus cruentus*). The best time to visit Java is during the dry season, which lasts from April till September.

Reference has been already made to the Deer of the islands of the Philippine group; it may be added that Mindanao is the habitat of a small Buffalo (*Bos mindorensis*) locally known as the Tamarau. Huge hairy Rats (*Phloeomys*) are likewise found in the Philippines; and reference may be made to Mr. John Whitehead's discovery of a peculiar fauna of Rodents in the mountains of Luzon, which exhibits certain affinities with the Muridæ of Australia. Flying Lemurs (*Galeopithecus*) are also found in the Philippines, ranging indeed through the Malayan islands to the Peninsula and Tenasserim.

The peculiarly-shaped island of Celebes stands apart from all those already mentioned by the strongly-marked Australian character of its animals; so much so, indeed, that the island was formerly grouped with New Guinea and Australia by Mr. A. R. Wallace. Its Oriental relationship is, however, exhibited by the presence of the Anoa (*Bos depressicornis*), the smallest representative of the Buffaloes, and of the Babirusa (*Babirusa alfurus*),

a small Pig remarkable for the great length and singular form and position of its upper tusks. Celebes also possesses a nearly tailless black Ape (*Cynopithecus niger*), representing a genus by itself, as well as a Macaque (*Macacus maurus*), and the weird little Lemur known as the Tarsier (*Tarsius*), another species of which occurs in the Philippines as well as in Java, Borneo, and Sumatra. A Civet and a Palm-Civet also occur. On the other hand, the presence of Cuscuses (*Phalanger*) gives an Australian cast to the fauna of the island, which is intensified by the existence of a Cassowary in Ceram, and of a Bird-of-Paradise in Gilolo and Batjan.

NEW GUINEA AND AUSTRALIA.—The Papuan Archipelago and Australia possess an assemblage of animals totally distinct from those of all the rest of the world, although, as already mentioned, a few of the characteristic types have managed to reach some of the most eastern islands of the Malay Archipelago. Among the most striking denizens of this area are the gorgeous Birds-of-Paradise, represented by some fifty species chiefly inhabiting New Guinea and the Papuan islands, especially the Aru group; one genus, however, is found in the Moluccas, while three occur in Northern Australia. Mention may be made of the Twelve-wired Bird-of-Paradise (*Seleucides nigricans*) from Salwatti and North-west New Guinea, the Scale-breasted species (*Ptilorhis magnifica*), and the Gorget Bird-of-Paradise (*Astrapia nigra*), both the latter being from New Guinea, and the last confined to the mountains of the interior. The Wattled species (*Paradigalla bicarunculata*), with its conspicuous orange and azure wattles, is likewise a New Guinea bird; but the typical, or Great Bird-of-Paradise

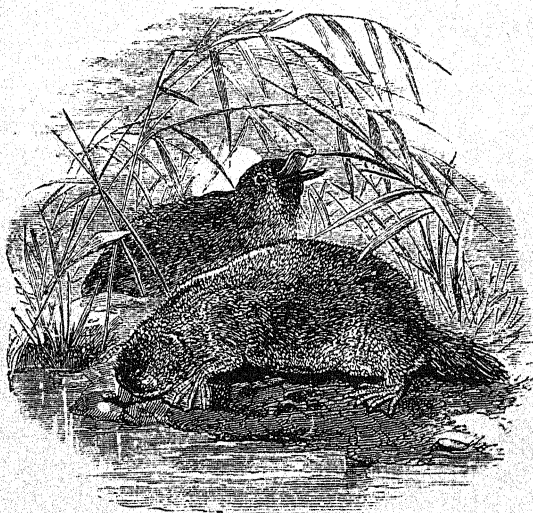
(*Paradisea apoda*), is also from the Aru islands. Not less notable are the King Paradise Bird (*Cicinparus regius*) of New Guinea, Wilson's Bird-of-Paradise (*Diphyllodes wilsoni*) from Waigion and Batanta, the Six-plumed species (*Parotia serpenensis*) of New Guinea, and the curious Standard-wing (*Semioptera wallacii*) from Batjan and Gilolo. The Bower-birds, taking their name from their curious habit of forming decorated "runs," are also an exclusively Australasian type, the great majority being restricted to Australia itself, although a few are found in the smaller Papuan islands, and one form (*Amblyornis*) is confined to New Guinea. The three species of Lyre-bird (*Menura*) are exclusively found in Australia. Paraquets and Lories are extremely abundant throughout the region, some of the latter being especially noticeable on account of their gorgeous colours. Cockatoos are likewise characteristic of the Australasian region, ranging, however, as far west as Celebes, Lombok, and the Philippines, and eastwards not extending farther than the Solomon group. Although found in many of the other Pacific islands, and represented by a single outlying species in the Nicobars, the family of the Megapodes and Brush Turkeys (*Megapodiidae*) is chiefly Australasian. For instance, the typical Brush Turkeys (*Talegallus*) are found only in New Guinea and some of the other Papuan islands, while the Australian Brush Turkey (*Catheturus lathamii*) is restricted to Australia. But, perhaps, the most important of all the groups of Australasian birds are the Cassowaries and Emus (*Casuariidae*); the Cassowaries (*Casuarinus*) inhabiting Australia, New Guinea, Ceram, and some of the neighbouring islands, and the Emus (*Dromæus*) not ranging beyond

Australia and Tasmania. Of other birds, it must suffice to mention the great Australian Bustard (*Choriotis australis*), the Laughing Kingfisher (*Dacelo gigas*), the splendid slaty-blue Crowned Pigeons (*Goura*) of Australia and the Papuan islands, and the Piping Crows (*Gymnorhina*) of Australia and Tasmania.

Even more remarkable than the birds are the mammals of the Australasian islands, the chief features being the abundance of Marsupials, and the presence of the only living representatives of the Egg-laying Mammals (*Monotremata*). As in the case of the birds, some of the Australasian types of mammals extend as far westwards as Celebes. Besides these Pouched and Egg-laying Mammals, comparatively few other members of the class are found in the area, and none worthy the attention of the sportsman. New Guinea has indeed a Wild Pig, which may or may not be indigenous; and both in that island and in Australia there are Fruit-Bats and numerous kinds of Rats and Mice, some of the two latter being more or less peculiar types.

New Guinea is remarkable for the number of its Tree-Kangaroos (*Dendrolagus*), as well as for its Cuscuses (*Phalanger*), the beautiful Spotted Cuscuses (*Dromicia*), and several Flying Phalangiers, some of the latter being scarcely larger than mice. Spiny Ant-eaters (*Echidna*), some of which also occur in Australia, represent the Egg-laying Mammals in Papua, where the Duck-bill, or Platypus (*Ornithorhynchus paradoxus*), of Australia and Tasmania is unknown. The large Kangaroos are likewise exclusively Australian. Foremost among these is the Great Gray Kangaroo (*Macropus giganteus*), distributed all over Tasmania

and the mainland except the extreme north, where it is replaced by the rare *M. antilopinus*. The Great Red Kangaroo, or "Red Buck" (*M. rufus*), is found in the timbered districts of many parts of the interior, but more particularly New South Wales, where the much smaller but equally handsome Parry's Wallaby



THE DUCK-BILL, OR PLATYPUS.

(*M. parryi*) also abounds. On the other hand, the Great Black Wallaroo (*M. robustus*) inhabits the mountain-ranges of the interior of New South Wales. Of Tasmanian carnivorous Marsupials the largest is the Thylacine, or Tasmanian Wolf (*Thylacinus cynocephalus*), restricted to the mountains of the interior; and here also is found the still more savage Tasmanian Devil (*Sarcophilus ursinus*). Wombats (*Phascolomys*) are common to Australia and Tasmania; whereas the

arboreal Koala or Native Bear (*Phascolarctus*) only frequents the eastern side of the mainland, from Queensland to Victoria. Of the smaller Marsupials mention may be made of the Rat Kangaroos (*Bettongia*, *Potorous*, etc.), the Flying Phalangiers (*Petaurus*), the Phalangiers, miscalled Opossums (*Pseudochirus* and *Trichosurus*), the Bandicoots (*Perameles*), and the Dasyures, or Native Cats (*Dasyurus*). Special attention may be directed to two rare species which should be collected whenever seen, namely, the Pig-footed Bandicoot (*Charopus castanotis*) and the Banded Ant-eater (*Myrmecobius fasciatus*) of the southern and western provinces of the mainland. Valuable, too, is the little Marsupial Mole (*Notoryctes typhlops*) from the sandy deserts of the interior of South Australia. Lastly, we must refer to the Australian Wild Dog, or Dingo (*Canis dingo*), whose presence among the Marsupial fauna is still an unexplained phenomenon.

Of recent years the Indian Buffalo has been introduced into the northern territories of South Australia, where it has run wild, and is hunted for the sake of its hide.

As regards New Zealand, it is almost unnecessary to mention that there are no indigenous mammals, although Red Deer have been recently introduced. There are, however, many notable birds, the most peculiar being the wingless Kiwis (*Apteryx*). The greatest rarity is the large Mantell's Coot (*Notornis mantelli*), of which a living specimen was obtained in 1898. In addition to many aquatic birds, Pigeons and Parrots of various descriptions are abundant, among the latter being the two peculiar types respectively known as the Kaka (*Nestor*) and the Owl-Parrot (*Stringops*).

The mention of Pigeons recalls the fact that Samoa is the home of the Saw-billed Pigeon (*Didunculus strigirostris*), a rare and peculiar species which appears to be the nearest living relative of the extinct Dodo of Mauritius.

ARABIA.—Our brief survey having now embraced, in addition to Australasia, the whole of the Euro-Asiatic continent, with the exception of Arabia, attention may be directed to that comparatively little known country before proceeding to the consideration of the "Dark Continent." And here it may be mentioned that Arabia, as regards its animals and plants, presents a transition between Europe and Northern Asia on the one hand, and Africa on the other; the fauna of its northern districts being of an Euro-Asiatic type, whereas that of its southern half (except in the mountains) is as distinctly African.

Of horned game there are several species, the most noticeable being a species of Tahr (*Hemitragus jayakeri*), from the mountains of Oman, nearly allied to the larger Himalayan species. The Beden, or Nubian Ibex (*Capra nubiana*), also found in the highlands of Northern Africa, inhabits all the mountain-ranges, from those of the Sinaitic Peninsula in the north to Hadramaut in the south. Its long, sharp-edged horns afford fine trophies. In the deserts of the interior occur the ungainly Bubal Hartebeest (*Bubalis boselaphus*) and the spiral-horned Addax (*A. nasomaculata*), both Saharan types, and the latter rare in collections. There are two Gazelles, the common *Gazella arabica* and the Muscat Gazelle (*G. muscatensis*). Rarest of all is the Beatrix Oryx (*O. beatrix*), the smallest member of the Gemsbuck group, and an inhabitant of Western Arabia, and perhaps also the

Bushire district on the opposite side of the Persian Gulf. A good skin of this rare Antelope would be a welcome addition to the Natural History Museum. Baboons belonging to the African genus *Papio* are met with in Southern Arabia, and the Asiatic Striped Hyæna (*H. striata*), as well as Jackals, occurs throughout the country. The Lion, however, appears to be nearly, if not completely, exterminated. The presence of the little Syrian Hyrax (*Procavia syriaca*), the "Coney" of the Bible, which is met with in rocky districts, helps to connect the fauna with that of Africa. The light-coloured Syrian Bear (*Ursus arctus syriacus*), although met with in Palestine, does not appear to extend into Arabia, where the nature of the country is unsuited to its habits. Game-birds are not numerous, the chief being the Black-headed Partridge (*Cucubis melanocephala*), which is the largest of the "Red Legs," and extends from the neighbourhood of Jedda and Mecca to Aden, and Hey's Sisi Partridge (*Ammoperdix heyi*), common to both shores of the Red Sea. In addition to these, flights of Common Quail and of more than one species of Sand-Grouse visit the country at certain seasons.

NORTHERN AFRICA.—That portion of Africa which lies, roughly speaking, to the north of the tropic of Cancer, is so different zoologically from the rest of the continent to which it belongs, that it is best treated separately. It is, indeed, in this respect, a portion of Europe and Asia rather than of Africa, and was connected at a comparatively recent epoch with Spain and other districts of Southern Europe. The area may be taken to include the provinces of Morocco, Algeria, Tunisia, Tripoli, and Lower Egypt, together with the northern portion of the Sahara; and it should be noted

that a certain number of animals characteristic of the more southern countries of Africa have succeeded in crossing the Sahara, and thus caused some mixture of distinctive African types with the northern fauna.

Certain animals inhabiting North Africa, such as the Lion, the Leopard, and the Hunting-Leopard, may be regarded in the light of cosmopolitan species, so far as the greater part of the Old World is concerned, being common to many parts of Asia and the whole of Africa. North African Lions are generally characterised by their deep yellowish-brown coat and grand mane. Other Carnivora are the Southern Lynx (*Felis pardina*), the Caracal (*F. caracal*), the Booted Cat (*F. maniculata*), and the Jungle-Cat (*F. chaus*). A little-known variety of the European Brown Bear (*Ursus arctus crowtheri*) inhabits the Atlas range, and is, indeed, the only representative of its kind found in the whole continent. Asiatic affinities are also indicated by the presence of the Striped Hyæna. Wolves, Foxes, and Jackals of a European type are likewise met with, although mingled with these in the desert districts is a small Fennec Fox. The Barbary Ape (*Macacus inuus*), also found on the rock of Gibraltar, is essentially an Asiatic, as opposed to an African type of monkey. On the other hand, Baboons (*Papio*) indicate African and Arabian resemblances. Genets and Mongoose also occur; the Common Genet (*Genetta vulgaris*) being likewise met with in Spain, as is the Southern Lynx already referred to. But perhaps the most characteristic European type is the Barbary Red Deer (*Cervus claphus barbarus*), while the Fallow Deer (*C. dama*) is also stated to exist in the neighbourhood of Constantine. These two species alone represent the Deer tribe in

Africa ; as does the European Wild Boar, which is very common in Morocco and Algeria, the typical group of the genus *Sus*. Unlike the rest of Africa, Antelopes are few and far between in this area, two of them, namely, the Bubal Hartebeest (*Bubalis boselaphus*) and the Addax (*A. nasomaculata*), being Arabian types. The White Oryx (*O. leucoryx*) ranges from the Sahara into the southern parts of the area under consideration, and in the Mohr Gazelle (*Gazella dama mohr*) Morocco possesses a local race of the Swift Gazelle of Senegambia. The three remaining Antelopes are also Gazelles, being the Common Gazelle (*G. dorcas*), the Edmi or Mountain Gazelle (*G. cuvieri*), and the straight-horned Rim or Loder's Gazelle (*G. leptoceros*). The great prize among the horned game is, however, undoubtedly the Udad, Arui, or African Wild Sheep (*Ovis lervia*), which is to be found in suitable localities from the Atlas to Lower Egypt, and is quite different from all other Wild Sheep, of which it is the sole African representative.

From the evidence of a pair of horns purchased at Tangier by Dr. Guillemard, as well as from other specimens in the Paris Museum, it seems probable that the Beden or Nubian Ibex (*Capra nubiana*) occurs in the Atlas range of Morocco, as it certainly does in the Mokatom Mountains bordering the Red Sea. And here it may be mentioned that another species of Ibex (*C. vali*), evidently an outlying member of the European fauna, inhabits the mountains of Abyssinia. So far as I am aware, this Ibex is a desideratum in English collections.

Hares are more or less abundant throughout Northern Africa. Of Game-birds, the handsome Barbary Partridge (*Caccabis petrosa*) is peculiar to North-western

Africa, Sardinia, the neighbourhood of Gibraltar, and some of the Canary Islands. The Common Francolin seems once to have occurred, but is now exterminated. Quail are, however, to be had, as are likewise Sand-Grouse (locally known as Kangar), Snipe, and Great and Lesser Bustard.

To show the number of European birds met with in Northern Africa, the following list from Mr. A. E. Pease's book on Biskra may be quoted; it includes Golden, Tawny, and Bonelli's Eagle, the Lammergeier, Ger-Falcon, Buzzard, Harrier, Kestrel, Sparrow-Hawk, Crane, Raven, Hoopoe, Ortolan, Jay, Pewit, Little Plover, Goldfinch, Desert-Finch, Desert-Lark, Common Lark, Greenfinch, Algerian Chaffinch, Willow-Wren, Swallow, Swift, Marten, Sparrow, and various Tits.

Regarding the present abundance or otherwise of big game in Tunisia, Sir Harry Johnstone writes as follows in the *Proc. Zool. Society* for 1898:—"Eighteen years ago I spent months in Northern Tunisia, and lived for some weeks with a French military expedition on the western borderland of that country. A good deal of sport was indulged in by the French and Tunisian officers, and as the result of one day's shooting I was able to picture in a group a Lioness, a Leopard, a Barbary Stag, a number of Wild Boars, a Hyæna, and some Mountain Gazelles. Such a bag would be impossible now. . . . The Lion is practically extinct in Tunisia; if any specimens still linger, they would be found in the thickly-forested mountains round Ain Draham, in the extreme north-west of the Regency."

AFRICA SOUTH OF THE NORTHERN TROPIC.—The hunting grounds of that portion of the African con-

continent situated to the south of the tropic of Cancer may be more conveniently considered by commencing at the southern extremity and gradually working our way northwards. But before so doing a short space may be devoted to a few of the peculiarities of the proper African fauna generally; that is to say, to the fauna of the vast area lying south of the above-mentioned line, in which alone these peculiarities are noticeable. And here it is important to mention that Ethiopian Africa, as the area in question is termed by naturalists, is by no means inhabited all over its extent by the same animals. Quite the contrary. And, as a matter of fact, this portion of the continent may be divided into three well-defined divisions, distinguished from one another not only by their physical conditions, but likewise by the animals which inhabit them. The first of these great divisions is known as the East Central tract, and includes the southern and eastern portions of the continent, together with such of the central districts as do not lie within the forest tract. It is true that the portion of the continent situated to the south of the tropic of Capricorn differs markedly in its physical conformation and vegetable products, and thus also to a certain extent in regard to its animals, from the districts farther north, but this difference is scarcely sufficiently pronounced to justify its separation from the remainder of the tract. Much the same remarks are applicable in the case of Somaliland. The second tract is formed by the forest region, which, although occurring in its typical form in the neighbourhood of the West Coast, extends right across the continent as far east as the Congo-Nile water-shed, near Wadalai. Lastly, there is the Saharan, or desert tract, forming a transverse belt of

from four to ten degrees in depth stretching across the continent to the northward of the other areas, and containing a comparatively limited fauna, which passes by almost insensible gradations into that of Northern Africa.

Taken as a whole, not only is the fauna of Ethiopian Africa characterised by the presence of a number of peculiar types of mammals and birds, but it is almost equally well distinguished by the absence of several groups which are elsewhere numerous. Among these missing forms, Deer, Sheep, and Bears are perhaps the most conspicuous, while, with the exception of the Arabian and Abyssinian species of Ibex, Goats are likewise wanting. The Pigs, too, are of a different type from those of other parts of the world, although a single species of the Euro-Asiatic group occurs in the mountains of Sennar. Among smaller mammals, Marmots, Susliks, Chipmunks, Beavers, Voles, and Picas are equally conspicuous by their absence, while Pheasants, Partridges,¹ Peafowl, and the entire Grouse tribe are unrepresented among birds.

Turning to some of the most striking of the exclusively African animals, there may be noted the Gorilla and Chimpanzee (both confined to the forest region), the Monkeys of the genera *Cercopithecus*, *Colobus*, and *Cercocebus*, and the Gelada Baboons (*Theropithecus*) and Dog-faced Baboons (*Papio*), although the latter are also sparingly represented in Arabia. The Lion, which is the largest of the African Carnivora, is also found in Northern Africa and parts of Western Asia, but the Spotted and the Brown Hyæna (*H. crocuta*, and *fuscus*), the Hunting-Dog (*Lycæon*

¹ Exclusive of Francolins.

pictus), and the Aard-Wolf (*Proteles cristatus*) are absolutely peculiar. The lordly African Elephant is a very different animal from its Asiatic relative, and the African Rhinos are still more markedly distinct from their representatives in Asia. The stately Giraffes, the unwieldy Hippopotami, the strongly armed Wart-Hogs (*Phacochoerus*), the Bush-Pigs, and the burrowing Aard-Vark (*Orycteropus*) occupy a very prominent position among the characteristic animals of the Dark Continent. But, perhaps, even more remarkable is the extraordinary development of Antelopes of various descriptions (ranging in size from the mighty Eland to the diminutive Dik-diks and the Royal Antelope), which occur in all parts of the continent, although most abundant on the open plains of the south and east. If we except the few African forms which inhabit the districts north of the Sahara or Arabia, and exclude the Gazelles, the Saiga, Chiru, and the Indian Blackbuck, Four-horned Antelope, and Nilgai, typical Antelopes are almost wanting in other parts of the world, whereas in Ethiopian Africa we have close upon a hundred different species and varieties. Eland (*Taurotragus*), Kudu (*Strepsiceros*), Harnessed Antelopes (*Tragelaphus*), Gnus (*Connochaetes*), Hartebeests (*Bubalis*), Bastard Hartebeests (*Damaliscus*), Duikers (*Cephalophus*), Waterbuck (*Cobus*), Reedbuck (*Cervicapra*), Gemsbuck (*Oryx*), Sable and Roan Antelope (*Hippotragus*), may be mentioned as a few of the groups of larger Antelopes practically confined to Ethiopian Africa. Equally distinctive are the various species of Zebra, and the now extinct true Quagga, while the Wild Asses of North-eastern Africa are very different animals from their Asiatic cousins. The little Hyraces (*Procavia*), locally known at the Cape

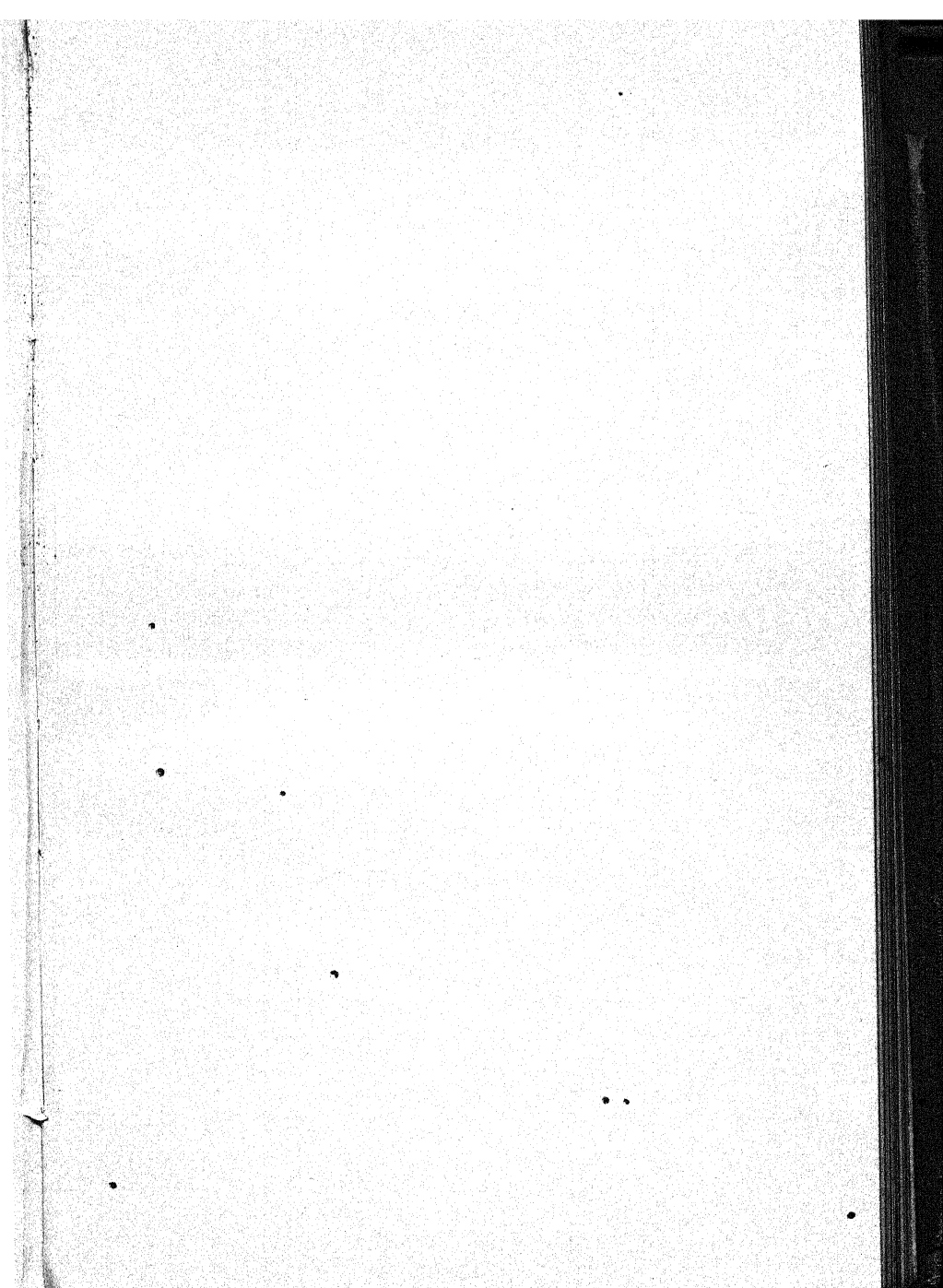
as "Dasies," are likewise a distinctive African type with a single outlying Arabian representative, some of the species having burrowing habits, while others are arboreal. Except for one Abyssinian species, there are no Wolves, but Jackals are abundant, in addition to which are Fennec Foxes (*Canis zerda*, etc.), and the Long-eared Fox (*Otocyon megalotis*), both exclusively African. The other small mammals peculiar to the continent are far too numerous to mention, but reference must be made to the Scaly-tailed Squirrels (*Anomalurus* and *Idiurus*), of the forest districts, which form a quite unique group.

Many interesting types of birds are likewise peculiar to Africa, but limits of space prevent reference to more than three or four. Ostriches, of course, claim the first place as characteristic African birds, although they also range into Arabia; but the Secretary-bird and the Guinea-fowls are solely African. Numerous species of Francolins, or Spurred Partridges (*Francolinus* and *Pternistes*), are likewise highly characteristic of the country, as are Sand-Grouse.

For the game animals (exclusive of birds) of Africa generally, the sportsman cannot do better than consult the *Great and Small Game of Africa* (London, 1899).

SOUTHERN AFRICA.—Including under this title the vast extent of country from the Cape to a line connecting the mouth of the Zambesi on the east to Walfisch Bay on the west coast, it will be necessary to divide it as a hunting field into several districts, there being comparatively few species of game animals common to the entire area, while the majority are confined to more or less restricted districts.

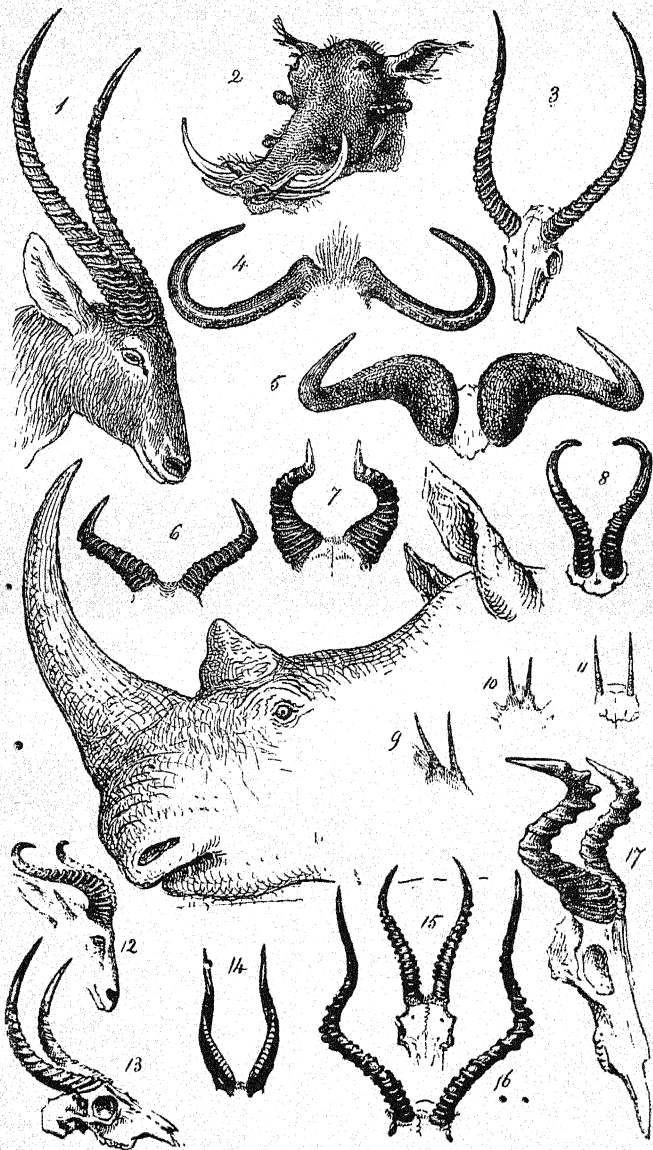
Cape Colony having been longer under European

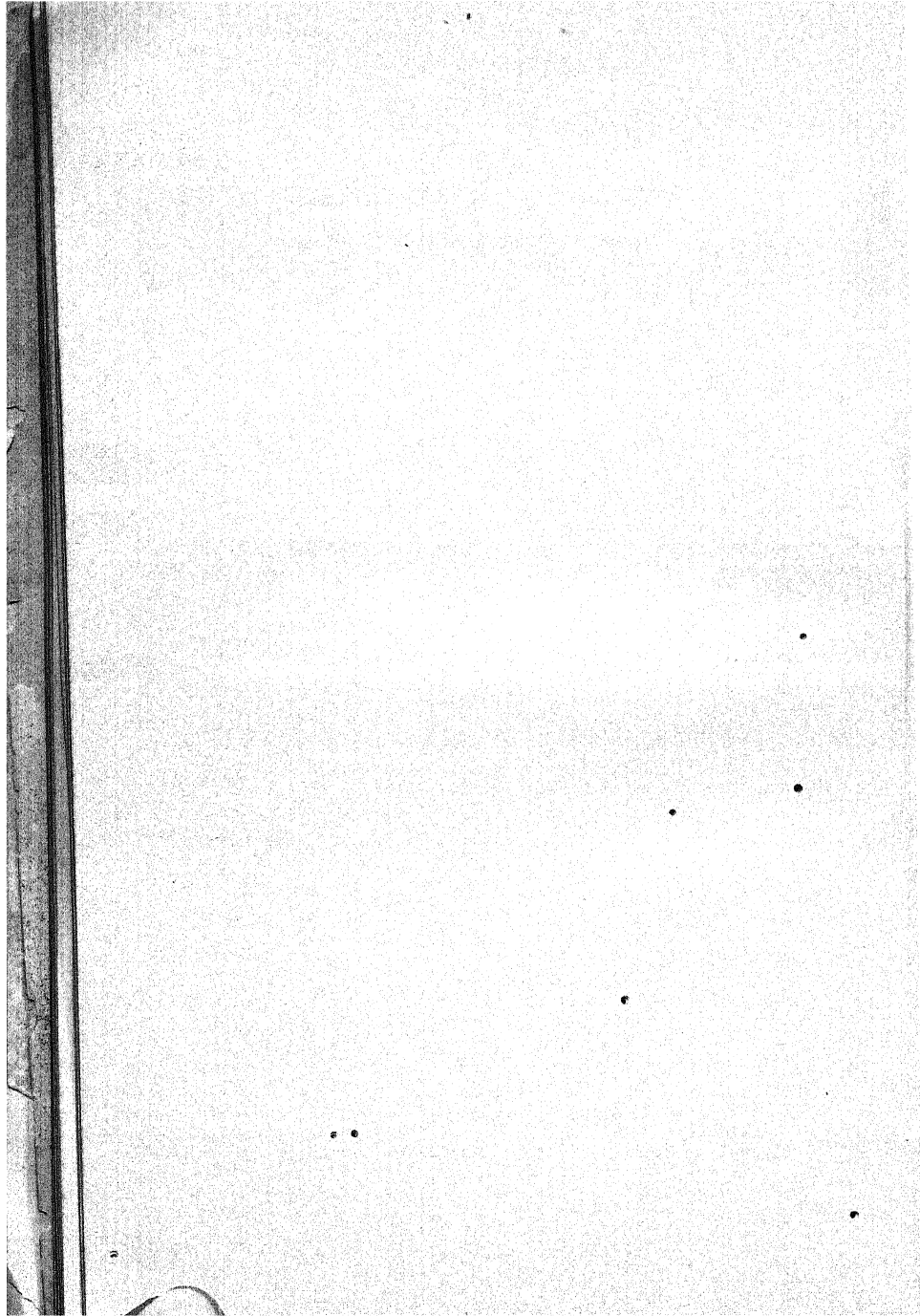


AFRICA

1. Waterbuck. *Cobus ellipsiprymnus*.
2. Wart-Hog. *Phacochoerus aethiopicus*.
3. Lechwi Antelope. *Cobus lechi*.
4. Black Wildebeest. *Connochætes gnu*.
5. Blue Wildebeest. *Connochætes taurinus*.
6. Tsessebe Antelope. *Damaliscus lunatus*.
7. Hartebeest (Lichtenstein's). *Bubalis lichtensteini*.
8. Springbuck. *Antidorcas euchore*.
Common Rhinoceros. *Rhinoceros bicornis*.
9. Klipspringer. *Oreotragus saltator*.
10. Grysback. *Nanotragus melanotis*.
11. Oribi Antelope. *Nanotragus scoparius*.
12. Sömmerring's Gazelle. *Gazella sømmerringi*.
13. Reedbuck. *Cervicapra arundinum*.
14. Bushbuck. *Tragelaphus sylvaticus*.
15. Blesbok. *Damaliscus albifrons*.
16. Impala. *Apycceros melampus*.
17. Cape Hartebeest. *Bubalis cama*.

* * For Measurements of Horns, Weights of Big Game, and other Statistical Information, see *Records of Big Game*, by Rowland Ward, F.Z.S. One vol. Illustrated. Price 30s. net.





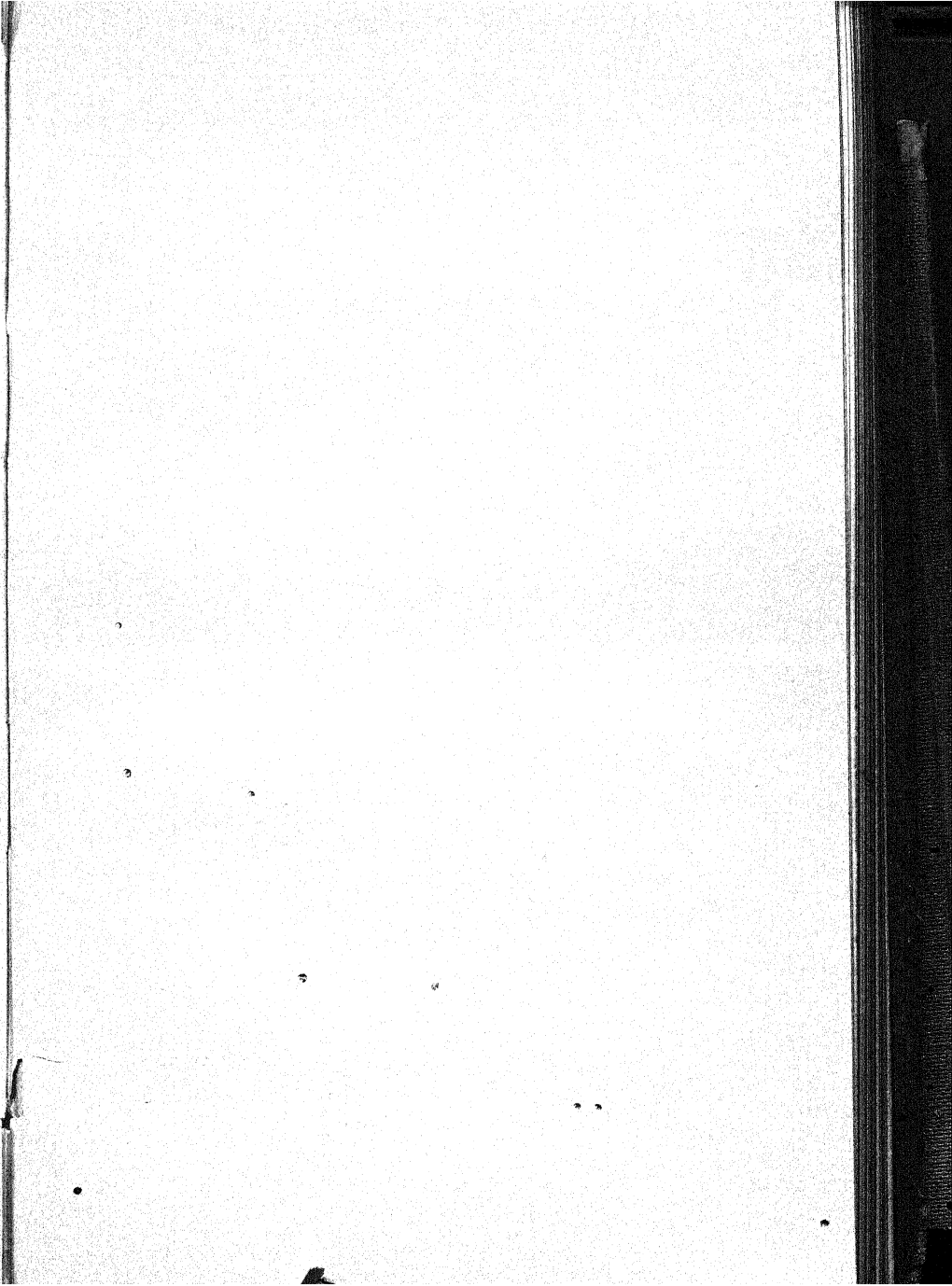
settlement than any other district in South Africa, it is not surprising to find that its big animals have been to a great extent exterminated; some indeed, like the Blaaubok (*Hippotragus leucophaeus*), and the true Quagga (*Equus quagga*) having become totally extinct. Of those that remain, the Cape Bushbuck (*Tragelaphus scriptus sylvaticus*), the Common Duiker (*Cephalophus grimmii*), the Blue Duiker (*C. monticola*), locally known as the Bluebuck, the Grysbook (*Rhaphiceros melanotis*), the Leopard, the Hunting-Dog (*Lycan pictus*), the Bush-Pig (*Sus chæropotamus*), the Cape Buffalo (*Bos caffer*), and the Elephant (*Elephas africanus*) are to be found in the coast districts. The two latter are, however, under Government protection, but permission is obtainable to shoot one or two specimens of each. Farther inland are found the Vaal Rhebok (*Pelea capreolus*), the Red or Rooi Rhebok (*Cervicapra fulvorufula*), the Klipspringer (*Oreotragus saltator*), the Steinbok (*Rhaphiceros campestris*), and the Springbuck (*Antidorcas euchore*). Bontebok (*Damaliscus pygargus*) remain only on Mr. Van der Byl's farm, near Swellendam, and White-tailed Gnu, or Black Wildebeest (*Connochætes gnu*), on another farm in Victoria West. The True, or Mountain Zebra (*Equus zebra*) is strictly preserved in some of the mountain-ranges of the Colony; and there, too, may still be found a few Kudu (*Strepsiceros kudu*). The Spotted Hyæna (*H. crocuta*) is also occasionally to be met with; but the Brown species (*H. fusca*) has become very scarce, even if it still survive.

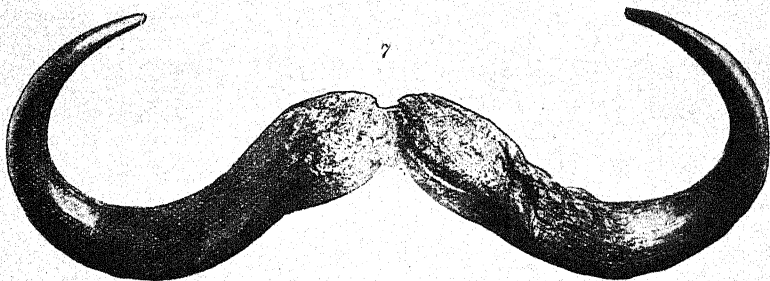
Passing northwards into Natal, the sportsman may obtain the Cape Bushbuck, the Common Reedbuck (*Cervicapra arundinum*), together with Steinbok, Oribi, (*Oribia scoparia*), the Natal Duiker or Redbuck

(*Cephalophus natalensis*), the Cape Duiker, the Blue Duiker, the Vaal and the Red Rhebok, and Klipspringer. Bush-Pigs and Leopards are of course to be found.

With regard to Zululand as a sporting-field, a correspondent writes that "during a two months' trip we saw several troops of Buffalo, one numbering from 60 to 100. Blue Wildebeest (*Connochætes taurinus*) were met in troops of 50-100, Waterbuck (*Cobus ellipsiprymnus*) in troops of 6-15, whilst Kudu were seen all over the country. Black Rhinoceroses were encountered when we were in suitable country, and once our party saw six Black and a White Rhino (*R. simus*) in one day. Between the fork of the Black and White Umvolosi Rivers several individuals of this species are protected by Government. We found Hippopotami in the lakes and so-called 'pans.' Burchell's Zebra (*Equus burchelli*) is fairly plentiful on the flats by the Umsinduri River. Bush-Pig, or Boschvark, are plentiful, and Wart-Hog (*Phacochoerus africanus*) met with occasionally. Reedbuck, Bushbuck, Red Rhebok, Impala (*Apyceros melampus*), Inyala (*Tragelaphus angasi*)—on the lake flats,—Bluebuck, the Natal and Cape Duikers, Steinbok, and Klipspringer, are found in more or less large numbers, Reedbuck being especially numerous."

As it has been already mentioned that the birds properly so-called are unknown in Africa, the sportsman may be somewhat puzzled by the frequent occurrence of the word "Pheasant" in lists of African game, and it may be well to explain that all the tree-roosting Francolins are termed *Phaysaants* by the Dutch, who call the ground-roosting Francolins and Sand-Grouse *Patraise* (Partridge). And here will be a convenient



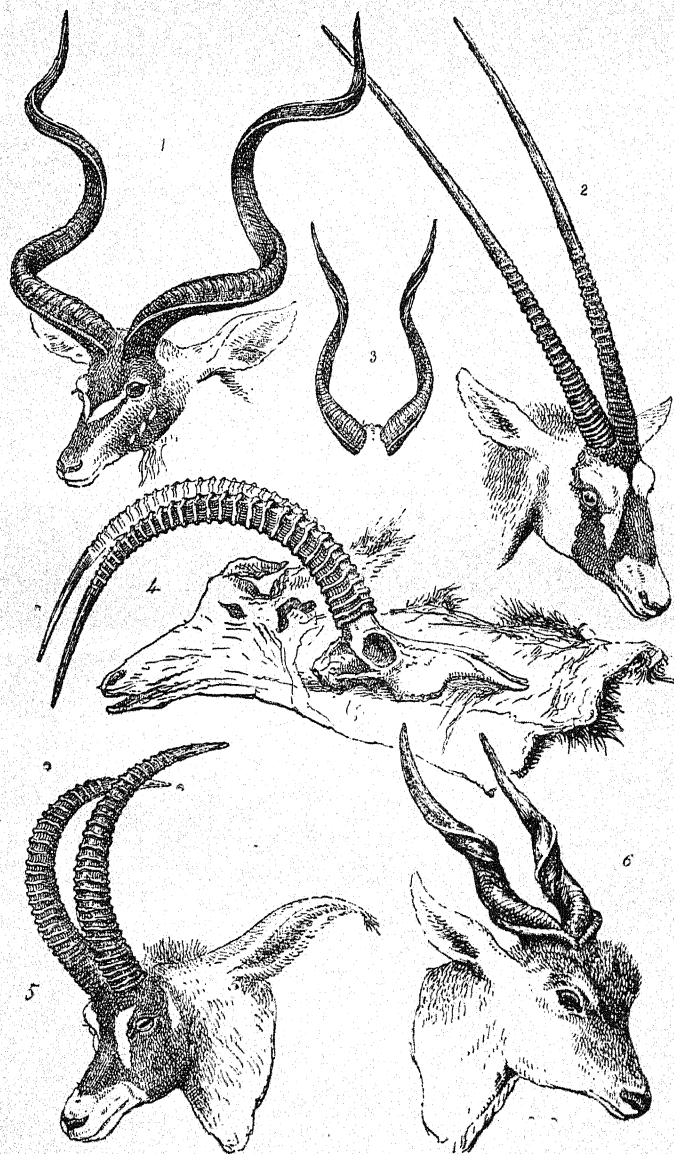


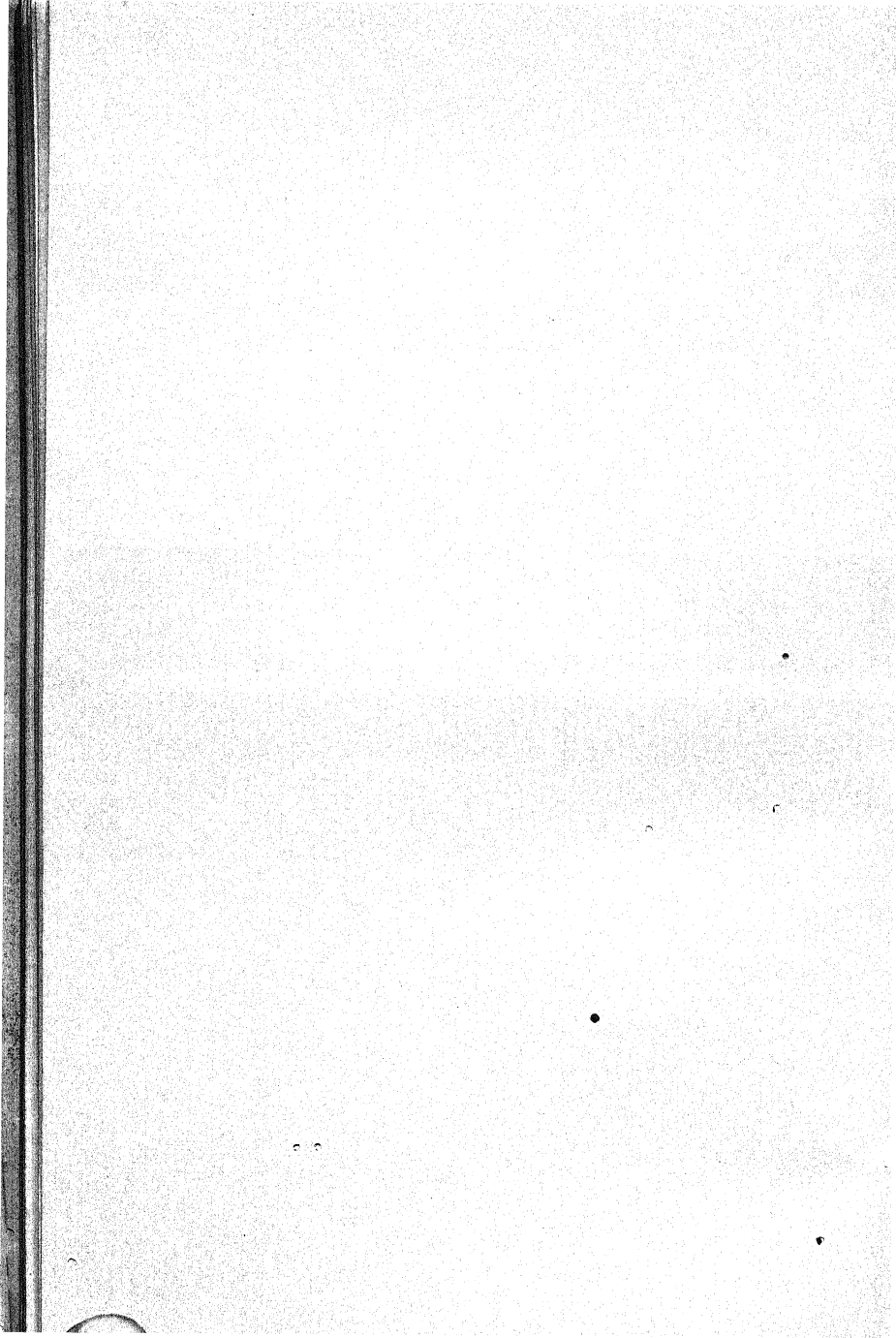
HORNS OF CAPE BUFFALO.

AFRICA

1. Kudu. *Strepsiceros kudu*.
2. Gemsbuck. *Oryx gazella*.
3. Situtunga Antelope. *Tragelaphus spekei*.
4. Sable Antelope. *Hippotragus niger*. (Scalp as saved on the field.)
5. Roan Antelope. *Hippotragus equinus*.
6. Eland. *Taurotragus oryx*.
7. Cape Buffalo. *Bos caffer*.

* * For Measurements of Horns, Weights of Big Game, and other Statistical Information, see *Records of Big Game*, by Rowland Ward, F.Z.S. One vol. Illustrated. Price 30s. net.





place to say a few words regarding the Game-birds of Southern Africa.

Among the Francolins may be noticed the widely spread Coqui Francolin (*Francolinus coqui*), Smith's Francolin (*F. sephæna*), the Pearl-breasted or Gray-wing Francolin (*F. africanus*), Levallant's Francolin (*F. levallanti*), commonly known as the Cape Red-wing, and the Gariep, or Orange River Francolin (*F. gariensis*), as well as the Cape and Natal species (*F. capensis* and *natalensis*). Equally characteristic, although less numerous in species, are the Bare-necked Francolins of the genus *Pternistes*, among which may be mentioned Swainson's (*P. swainsoni*) and the Cape species (*P. nudicollis*), other kinds occurring to the north of the Zambesi, as well as in Angola and the neighbouring provinces. The Common Quail is to be found in great abundance in Cape Colony, the Transvaal, and Natal, the migrations usually commencing about August, but depending on the rainfall. On the other hand, the Harlequin Quail (*Coturnix delegorgnei*) is a much less common bird. Button-Quail (*Turnix hottentotta* and *lepurana*) are met with sparingly throughout Southern Africa, where two kinds of Guinea-fowl (*Numida verreauxi* and *pucherani*) likewise occur to the south of the Zambesi. Of Sand-Grouse the sportsman may encounter three kinds, namely, the Double-banded, the Variegated, and the Yellow-throated, the last being the *Naacht patraise* of the Dutch. Very characteristic of Southern Africa are the numerous species of Bustards, among which the Kori (*Eupodotis kori*), the *ghaam-paarw* of the Boers, is the largest, and is now most abundant in the Transvaal and Bechuanaland. The Stanley Bustard (*Eu. caffra*) is another member of the same genus,

still found in the Karoo; and among the numerous kinds locally known as Khurhaan, mention may be made of the Blue Bustard, or Khurhaan (*Trachelotis caerulescens*), now most abundant on the flats of the Orange Free State. The South African Thick-knee, or Dikkop (*Aedinenus capensis*) and the Natal Dikkop (*A. natalensis*) are likewise well-known birds of sport. Here also may be mentioned the Southern Crowned Crane (*Balearica chrysopelargus*), the African Marabou Stork, or Adjutant (*Leptoptilus crumenifer*), the Greater South African Flamingo (*Phaenicopterus erythræus*), abundant in the neighbourhood of Walfisch Bay, the Lesser Flamingo (*Ph. minor*), the Stanley Crane (*Tetrapteryx paradisea*), and the Secretary-bird (*Serpentarius secretarius*).

The list of South African Water-fowl is a long one. Among them may be mentioned the Spar-winged Goose (*Plectropterus gambensis*), the Egyptian Goose (*Chenalopez aegyptiaca*), which is the common wild Goose of the Cape, the Knob-billed Duck (*Sarcidiornis africana*), not found south of the Orange River, the Muccoa Diving Duck (*Erismatura muccoa*), the Marked Duck (*Dendrocygna viduata*), common on the Zambesi and its tributaries, but rare farther south, the Crimson-billed Teal (*Paeilonetta erythrorhyncha*), of the northern districts, the Cape Teal (*Querquedula capensis*), the Yellow-billed Teal (*Qu. xanthorhyncha*), the commonest species in the Cape Colony, and the Hottentot Teal (*Qu. hottentotta*), the smallest of all the Cape Wild-fowl. The common Snipe of the country is the Black-quilled species (*Gallinago nigripennis*), but the Great Snipe (*G. major*) is also met with. Lastly, we have the Painted Snipe (*Rostratula capensis*), sparsely distributed all over the country. Reverting to four-footed game,

it may be noted that on the open plains of the Orange Free State and the Transvaal herds of Blesbuck (*Damaliscus albifrons*), Springbuck, and Brindled Gnu are still to be met with, although in continually decreasing numbers, and in more circumscribed localities. A few of the smaller kinds of Antelopes are likewise to be found in these territories, while in the northern and eastern districts of the Transvaal a small number of Lions, Giraffes, Buffaloes, and certain kinds of the larger Antelopes still maintain a foothold.

With regard to the game of the territories of the British South Africa Company, lying to the north of the Transvaal, between the Limpopo and Zambesi Rivers, the following notes are chiefly compiled from Mr. F. C. Selous's well-known work. But it is necessary to remember that, what with the ravages of the rinderpest and other causes, the head of game has been very seriously diminished since the date of writing. In addition to Elephants, which are nowadays few and far between to what they were when the country was first opened up, are to be found both the common and Burchell's Rhinoceros, the latter being well-nigh exterminated, and almost confined to Northern Matabeleland and adjacent portions of Mashonaland. Hippopotami are plentiful in the Zambesi and its larger tributaries; Buffaloes are numerous along the Chobi, as well as on the tributaries of the Zambesi eastward of the Victoria Falls. There are likewise Giraffe (*Giraffa capensis*); Eland (*Taurotragus oryx*); Gemsbuck (*Oryx gazella*), confined to the open western districts; Sable Antelope (*Hippotragus niger*), very numerous in Mashonaland; Roan Antelope (*H. equinus*); Kudu; Waterbuck; Harte-

beest (*Bubalis cama*), with a range very similar to that of the Gemsbuck; Lichtenstein's Hartebeest (*B. lichtensteini*), found near the Sabi River in South-eastern Mashonaland; Impala; Sassabi (*Damaliscus lunatus*); Lechwi (*Cobus lechi*), common in the swamps of the Botletli, Mababi, and Chobi Rivers; Puku (*C. vardoni*) typically form a small area on the southern bank of the Chobi; and Situtunga (*Tragelaphus spekei*), in the swamps of the Mababo, Machabi, and Chobi. The Antelopes likewise include Brindled Gnu, Reedbuck, Oribi, Duiker, Klipspringer, Spotted Bushbuck (*Tragelaphus scriptus typicus*), and Grysbeck. Among other animals may be mentioned Burchell's Zebra, Bush-Pig, Wart-Hog, Leopard, Hunting-Leopard or Chita, Spotted Hyæna, Hunting-Dog, Caracal, Serval, Civet, Ratel, Otter, Porcupine, and Aard-Vark. Jackals are, of course, abundant, and Lions are to be found throughout the country wherever there is game. And here it may be noted that Lions are really, as well as apparently, scarce at the present day in most parts of South Africa, where they seem to be more completely nocturnal, and therefore less frequently seen than in North Africa.

Since the opening up of South-east Africa by the Chartered Company, their territory has been connected with the East Coast by railway; Beira, in Portuguese territory, being the starting-point for a short trip, commencing, say, in August or September. Game is plentiful in this district, especially in the country adjacent to the Pungwe River.

More is said about Portuguese Africa later on, but here a few words must be devoted to the Kalahari district and Khama's country, bordering on Western Bechuanaland, which form a last refuge for many of

the fast-disappearing species of great game. Although covered with grass during the rains, much of the Kalahari is almost a desert in the dry season, which renders travelling difficult, and thus serves as a protection to the animals. Here is the great stronghold of the South African Giraffe; while Hartebeest are to be met with in large troops, Gemsbuck are still far from uncommon, and Springbuck occur in considerable herds, although in no wise comparable to those of the old days. Such other of the large game mentioned above as are capable of existing for part of the year without water, are likewise to be met with in the Kalahari.

EAST AND EAST CENTRAL AFRICA.—From my present standpoint the most important territories included under this heading are British Central and British East Africa; but they also comprise Portuguese and German East Africa. Somaliland, Abyssinia, the Sudan, and the Red Sea Littoral, on the other hand, may be more conveniently considered under a separate heading.

As regards the animals of Portuguese East Africa, it may be mentioned that the Cape Baboon (*Papio porcarius*) is replaced in the territories north of the Zambesi by the Yellow Baboon (*P. babuin*), a species common throughout tropical Africa south of the equator. Smaller Monkeys of various kinds are of course abundant, while members of the peculiarly African animals known as Galagos are to be met with. Lions are to be found in most districts, and abundantly in the Urema and Pungwe valleys, but are rare in the interior of the Mozambique province. The latter remark applies to the Leopard; but the Serval is everywhere common, as is the Spotted Hyæna, except in the interior

of the aforesaid province. Of Jackals, the Dusky species (*Canis adustus*) is widely distributed, whereas the Black-backed (*C. mesomelas*) is local and rare. Throughout Portuguese East Africa and Northern Zambesia the Buffalo is still numerous, as it also is in the Shiré districts; but on the Urema and Pungwe it abounds. Eland, chiefly of the striped variety, are to be met with in suitable localities. Among other large Antelope may be named Kudu, Inyala, Sable, Roan, Impala, Reedbuck, Waterbuck, Sing-sing,¹ Brindled Gnu, Lichtenstein's Hartebeest, and Tsessebe; and of the smaller kinds, Bushbuck, Klipspringer, Oribi, Steinbok, Duiker, Natal do., and Livingstone's Antelope (*Nesotragus livingstonianus*). Bush-Pig and Wart-Hog are, of course, to the fore, and Hippopotami are still fairly common, although they have to a considerable extent deserted the main stream of the Zambesi for the neighbouring lagoons. Burchell's Zebra and the Black Rhinoceros are to be met with in suitable localities, over the greater part of the area. As regards Elephants, these are seldom met with during the dry season in the interior of the Mozambique Province, as they appear to migrate eastwards; but after the rains set in scattered troops may be found in many places throughout the southern portion of the Province—the Lomwe range, along the Namatimba and Mrumbi rivers, the Chiperoni and Mongwe mountains, the Lumwi and Ingundungwa ranges and the Lower Lualwa, Lugira, and Lukugu rivers. They are fairly numerous along the Mrupe and Mabo ranges, but do not occur beyond them until the Liuli is reached. In Portuguese Northern Zambesia there are now probably few, if any, left.

¹ *Cobus defassa crawshayi*.

Passing northwards into British East Africa, I give extracts from a letter of Mr. W. Carlile Fraser, which appeared in *The Field* of January 1, 1897.

No good shooting can be obtained near Mombasa, and there is little till Teita is passed. Nearly all the journey from Taveta to Kikuyu is through good game-country. The route would depend on the season, as in many parts there is little water during the dry time. There are two or three roads to different parts of the Bura Hills, one past the mission-station at Mkuyuni, to Matate.

When there is water, any amount of game can be found near the hole at Mzungu-kibaba. In that neighbourhood I have seen Giraffe, Eland, Fringe-eared Beisa (*Oryx callotis*), Grant's Gazelle (*Gazella granti*), Gerenuk (*Lithocranius walleri*), Hartebeest, and Zebra. In Taveta forest there is little game, except a few Bushbuck, Waterbuck, and Pig. To the west there are a few Rhino on a hill called Latema, but they are difficult to find, owing to the thickness of the bush.

North of Taveta is a camping-place at a swamp which feeds the Tsavo River; it is called Marago ya Simba (The Camp of Lions). There are a few Buffalo in the swamp, and they existed in hundreds before the rinderpest in 1890 and 1891. "In the dry season there are thousands of Antelope and Zebra, and even in the wet weather shooting is to be had on the river which flows out of the swamp. Francolin and Sand-Grouse are numerous at the water in the mornings and evenings; there are also Ostrich and Great Bustard.

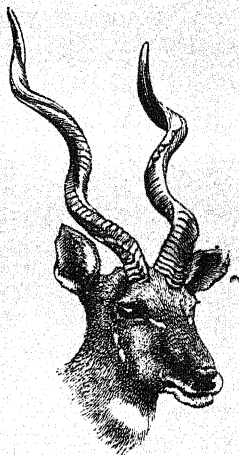
"Round Ada there are Sable and Roan Antelope and Lesser Kudu (*Strepsiceros imberbis*), but only a few of them. At Mweli *Colobus kirki* can be found in almost

any numbers; they are the most common kind of Monkey in that part."

The animals referred to in the foregoing extract,



GRANT'S GAZELLE.



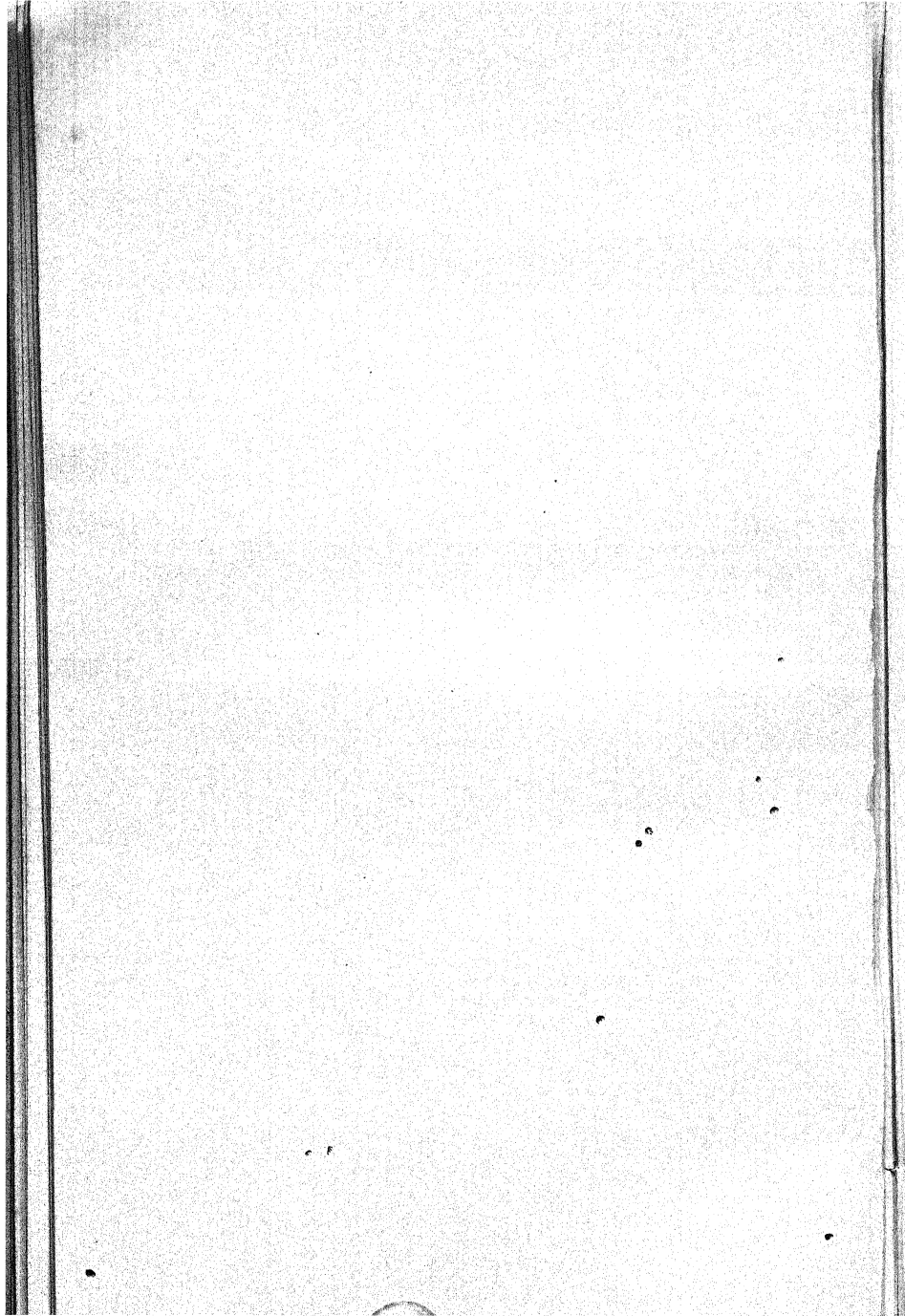
LESSER KUDU.

GERENUK, OR WALLER'S GAZELLE.

are only a few of those inhabiting East Africa, but to mention all would be wearisome. It may be observed, however, that the beautiful Hunter's Hartebeest (*Damaliscus "hunteri"*) is to be found in numbers on

MRS GRAY'S WATERBUCK





the north bank of the Tana River; and that the small but handsomely marked Thomson's Gazelle (*Gazella thomsoni*) is an inhabitant of the district. Here also, especially in the neighbourhood of Lake Rudolf and Mount Kenia, we enter the habitat of the tiny Dikdik Antelopes (*Madoqua*). On the northern shore of the Victoria Nyanza the Uganda Kob (*Cobus thomasi*) takes the place occupied by the Puku farther south. Impala, Brindled Gnu, Reedbuck, Bushbuck, Harnessed Antelope, Duiker, and Steinbok are all to be found in the immediate neighbourhood of Kilima-Njaro. The beautiful black-and-white Guereza Monkeys (*Colobus guereza* and *caudatus*) also abound in the forests, where their long mantle of white hair harmonises so exactly with the pendant lichens on the trees, that they are almost invisible. In the rivers and lakes are Hippopotami and some Crocodiles. Immediately west of the Victoria Nyanza and Uganda, within the Congo basin, the western forest tract is entered, and here the Chimpanzee (*Anthropopithecus troglodytes*), as well as other western types, may be encountered.

The Njiri plain is a great resort of game; and between Naivasha Lake, which is twelve milés long by nine wide, and the mountains, as well as to the north of Naivasha, are other grassy plains which teem with game. The lake itself is the home of countless thousands of Pelican, Ibis, Duck, and other aquatic birds, as well as of Hippopotami. Between this and Mount Kenia there are many hunting grounds, while on the western flanks of the mountain the trackless forests are full of Elephant, Rhinoceros, Buffalo, and other big game. And here it may be mentioned that somewhere in this district the connecting form between

the Cape Buffalo and the Abyssinian Buffalo (*Bos caffer equinoctialis*) is to be looked for. The country between Kenia and Lake Baringo in a direction north-west by west is covered with forest, with several rivers; and Elephant, Buffalo, Rhinoceros, Zebra, and Giraffe occur in astonishing numbers. North of Baringo lies the Enzobot Elephant forest.

SOMALILAND, ABYSSINIA, AND THE EGYPTIAN SUDAN.
—Of late years Somaliland, partly owing to its accessibility, and partly to the abundance of its game, has become a fashionable sporting-ground, although it is not what it once was. It is specially remarkable for the number of its Antelopes, several of which are peculiar to the district, some inhabiting the low ground in the neighbourhood of Berbera, while others are restricted to the Haud, or plateau of the interior. The Antelopes include Swayne's Hartebeest (*Bubalis swaynei*); three species of Dik-dik (*Madoqua swaynei*, *phillipsi*, and *guentheri*); the Klipspringer; the Beira (*Dorcotragus megalotis*); the Waterbuck; three kinds of Gazelle, namely, *Gazella pelzelni*, *spekei*, and *scammerringi*, the latter being a very large species, locally known as the Aoul. The Dibatag, or Clarke's Gazelle (*Ammodorcas clarkei*), is peculiar to the country; and there also occur Gerenuk, Beisa, Abyssinian Bushbuck (*Tragelaphus scriptus decula*), and both kinds of Kudu. Lions are numerous in the forest on the slope near the coast, and Leopards abound, while the Aard-Wolf is also found. There is likewise a peculiar species of Zebra (*Equus grevyi*), also found in the Shoa country, as well as a Wild Ass (*Equus asinus somalicus*) and the Wart-Hog. May, June, and December are the best months for Somali shooting, and to a party arriving in April, Berbera is the best

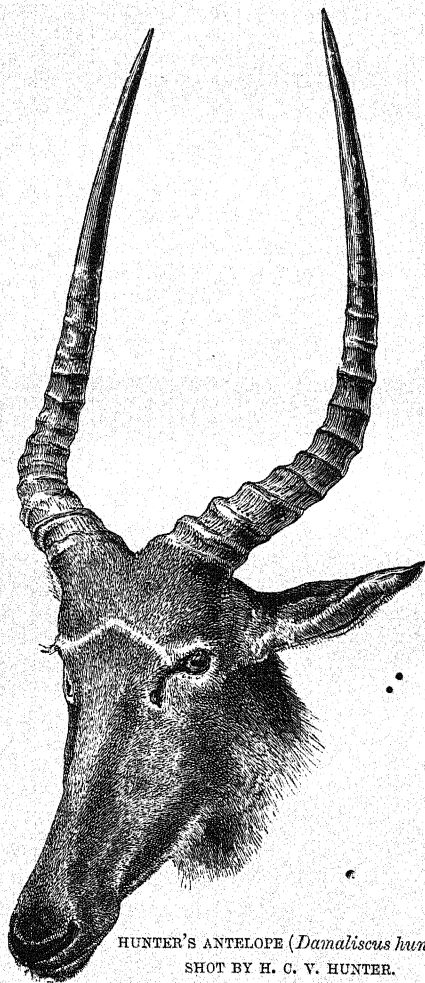
landing-place. Starting thence with camels, Mandara, a valley under the Gnu Libah Mountain, in the Golis range, forms good headquarters. Beyond the latter range, at Gulaneh, Elephant, Giraffe, and Rhinoceros were formerly to be met with. Now, however, Elephants are exterminated from the district, except perhaps in the Gadabursi country, the sport in which is reserved for the Aden garrison.

Among the birds of Somaliland mention may be made of the Bee-eater (*Merops cyanostictus*), a Shrike (*Prionops poliocephalus*), a Flycatcher (*Tersiphone cristata*), a Woodpecker (*Thripias schoensis*), a small Dove (*Chalcopelia afra*), a Kingfisher (*Halcyon chelicutensis*), a Weaver (*Tector dinemelli*), Sunbirds, Waxbills, Teal, Francolin, Guinea-fowl, Sand-Grouse, Hornbill, Shoveller, Egyptian Goose, Plover, Somali Courser, Blue Roller, Avocet, Bustard, and various Owls and Eagles.

As regards books, the sportsman cannot do better than refer to Major Swayne's *Seventeen Trips to Somaliland*.

Abyssinia is not a country much visited by sportsmen, but the mountains of parts of the interior abound with game, many of which are identical with those of the more southerly districts of Eastern Africa, or of the Sudan, while a few are peculiar. The little-known Abyssinian Ibex (*Capra vali*), for instance, inhabits the highlands of the interior, and indicates that we are on the borderland between the fauna of Africa south of the tropic with that of North Africa. To quote the names of all the species inhabiting the country would be little better than waste of space. It may be mentioned, however, that the Buffalo (*Bos caffer equinoctialis*) inhabiting the south of Somaliland,

Abyssinia, and the Southern Egyptian Sudan, is a



HUNTER'S ANTELOPE (*Damaliscus hunteri*),
SHOT BY H. C. V. HUNTER.

brown variety, of the Cape species, distinguishable by the form of its horns. In the same district the Roan

Antelope is represented by a variety (*Hippotragus equinus bakeri*), while the Sing-sing (*Cobus defassa typicus*) is the Waterbuck of the country. The remarkable Gelada Baboon (*Theropithecus gelada*) is likewise a characteristic inhabitant of the Abyssinian highlands.

The following notes on the big game met with in the Eastern Sudan, on the Egyptian-Abyssinian boundary, are abbreviated from *The Field* of March 10, 1899, and were taken from the letter of an officer of the Anglo-Egyptian army stationed in the district. "Elephants," writes the narrator, "are now about two days south of this, but come close in the rains; their tracks have been seen about three miles off. Giraffe also come in the rains. Kudu and Buffalo are about two days from here, and I fancy come closer later on. Lions are in the hills near at hand, but after the grass has been burnt go farther. Leopards I have heard but not seen, although I am told they are numerous. Titel Hartebeest (*Bubalis tora*) and Wart-Hog are common; and Gazelles of three kinds are very numerous and come close to the houses. Dik-dik are likewise abundant. Bustard are common, as well as Sand-Grouse, and there is also a bird about the size of a Partridge, with red legs, and rings round the eyes, and plumage like a hen Pheasant. Guinea-fowl likewise occur, but there are no Hares. North of Fasher, on the Atbara, and near Kassala, there is still another sort of Gazelle, similar to those near Suakim. Ariel (*Gazella sammerringi*) I have not seen south of Fasher, on the right bank of the Atbara. I shot Giraffe on the right bank of the Atbara, about twenty to fifty miles south of El Fasher, in September last, as well as Wart-Hog, Gazelle, Titel, and Ostrich."

The swamps of the White Nile, the Bahr-el-Ghazal, and the Sobat, are the haunts of that beautiful member of the Waterbuck group known as Mrs. Gray's Waterbuck (*Cobus maria*), skins of which are at present a desideratum in the British Museum. The last-named valleys are likewise the habitat of the White-eared Kob (*C. leucotis*).

For shooting on the Nile south of Khartum the best months are April and May, when the grass is burnt off, and the game come down to the Nile; few of the inland streams not being dried up. At other times the grass is eight or nine feet high, and the game hidden. Shooting at present can be only obtained from steamers, and it is difficult to get far from the banks. The animals include a Gazelle, the Defassa, the White-eared Kob, Mrs. Gray's Waterbuck, and Tiang (*Damaliscus corrigum tiang*).

Passing to the Red Sea littoral, the following particulars, from notes furnished by Mr. A. B. Wylde, for many years resident in this part of Africa, will be found of interest:—In the mountains Ibex (*Capra nubiana*) are very plentiful, bucks with good horns being obtainable in the Elba Mountains, one and a half day's march from the seaport of Haläib; also in the Ertä Mountains, one day's march from the port of Mahamed Ghoul, as well as in the Bowartie and Asortriba Mountains, in the neighbourhood of Suakim. Between these mountains and the coast is found the Dorcas Gazelle (*Gazella dorcas*), as is the Great Arabian Bustard (*Eupodotis arabs*); the Hubara Bustard being rare. There are also Hares, Thick-knee Plover, and Duck and Quail in the proper season. Hey's Sisi Partridge (*Ammoperdix heyi*) is common in the mountains, where droves of Dog-faced Baboons are

occasionally to be met with. The Audad is found, but rarely, two days' march west of Bowartie. The northern limit of Sömmerring's Gazelle (incorrectly termed the Ariel) reaches to the coast at Durur, and on the coast plains a few stray Ostriches are still to be found.

To the south-west of Suakim are the mountains of Singat and Erkowit, where better sport can be obtained, since, in addition to Ibex, Klipspringer, Salt's Dik-dik (*Madoqua saltiana*), Hey's Sisi, Rüppell's and Ereke's Francolin, and the Abyssinian Guinea-fowl are to be met with. Leopards are still found round Erkowit; but the Lion is exterminated north of the Baraka.

Another shooting district on the Egyptian Red Sea littoral is entered from Aghig, ninety miles south from Suakim, and is far the best from the sportsman's point of view. In addition to the game mentioned above, the Beisa, the Titel or Tora Hartebeest, and the Addra Gazelle (*Gazella ruficollis*), frequently misnamed the Mhor, are to be found on the plains and in the valleys; at the foot of the hills the Wart-Hog and Kudu are common. Both the Lion and the Leopard often descend to the plains, and a few Rhinoceros still survive. Five to six days' march farther inland the Elephant and the Buffalo may be encountered, as well as several species of Antelope different from those already enumerated. Several good shooting trips may be made from Massowa; one through the Beni Amer country, crossing the Khor Baraka into the Basē country, and returning *via* Sanheit and Kelamet. A second *via* Asmara to the Walkeit country; shooting being obtainable immediately after proceeding westward from Gudu-felasie. A short trip would be through the Shoho and Asorta districts to Halai;

Elephants, in addition to Lions and other game, being plentiful at the time when this communication was penned. Another short trip would be through the Hartan Peninsula Danakil country, and thence back to Aripahale at the south of Annesley Bay.

The country northwards of Aghig appeals to the naturalist rather than to the sportsman, small animals, such as Hyæna, Wolf, Hunting-Dog, Ratel, Foxes, Jackals, Cats, and Weasels, together with Rats, Mice, and other Rodents, being more numerous than the larger descriptions of game. A sportsman leaving London could be among the Ibex in a fortnight, and among big game, *viâ* Massowâ, in three weeks. The shooting season is from October till the end of April; the three bad months being June, July, and August.

In regard to the early access to Erythrea and the neighbouring districts, the following letter was communicated to *The Times* of August 18, 1894, by Mr. Rowland Ward:—

“The Italian advances to Kassala and its environs, and the driving out of the dervishes from the district, have again opened up one of the largest and best sporting countries, where large game can be procured within a reasonable time from London. In 1882, the last year when English sportsmen visited the country, communications were not so frequent, and the steamers employed then were inferior to those used now. Travellers wishing to go to Massowa, the chief town of the Italian colony of Erythrea, can book at Messrs. Cook's, fortnightly from Naples direct to Massowa, or weekly *viâ* Aden, by the Italian mail boats, and the voyage from London to Massowa need not exceed 14 days. Trackers and reliable guides for the surrounding country can be procured at Massowa, where there is

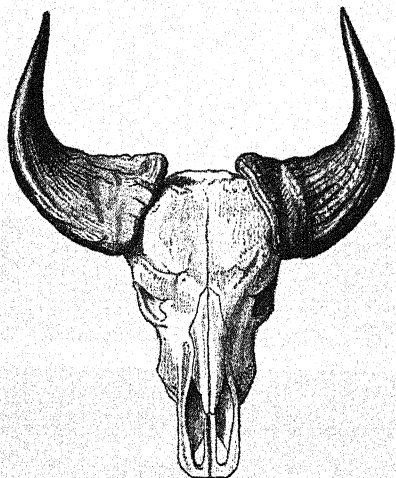
now decent hotel accommodation, and supplies can also be procured at the interior towns of Asmara and Keren, to which places good roads have been made."

WEST AFRICA.—Algeria and Morocco, etc., having been already treated of under the heading of North Africa, attention may now be directed to the West Coast, from Senegambia to Angola. It may be mentioned, in the first place, that till within the last few years the greater part of these districts has been quite unknown as hunting fields. They are, however, being gradually opened up, although many provinces are still practically unknown.

In regard to the Gambia, Mr. Selater remarked, in a paper recently contributed to the *Proceedings of the Zoological Society*, that since there is fortnightly access to the country by steam, while the climate is fairly healthy in the dry season, it is somewhat singular that sportsmen and naturalists have not hitherto made their way there. Years ago, indeed, Whitfield, Lord Derby's collector, brought home some fine specimens for the Knowsley menagerie, while recently Dr. Percy Rendall and Sir R. B. Llewelyn have obtained others. In addition to game of other descriptions, fourteen kinds of Antelopes have been recorded from the Gambia. These are—the West African Hartbeest (*Bubalis major*), the Korigum (*Damaliscus corrigum*), the Ruddy Duiker (*Cephalophus rufilatus*), Maxwell's Duiker (*C. maxwelli*), the Crowned Duiker (*C. coronatus*), the Gambian Oribi (*Oribia nigricaudata*), the Western Sing-sing (*Cobus defussa unctuosus*), Buffon's Kob (*C. kob*), the Nagor Reedbuck (*Cervicapra redunca*), the Red-fronted Gazelle (*Gazella rufifrons*), the White Oryx (*Oryx leucoryx*), the Roan Antelope (*Hippotragus equinus*), the West African Bushbuck* (*Tragelaphus*

scriptus), and the Gambian Eland (*Taurotragus derbianus*). The Buffalo, too, forms a distinct variety (*Bos caffer planiceros*).

In regard to the Gambia River, Mr. H. L. Stephen writes that it is navigable for 300 miles from its mouth, even for ocean-going steamers; and that



SKULL AND HORNS OF CONGO BUFFALO FROM MAJOR A. J. ARNOLD'S SPECIMEN.

the neighbourhood is a good sporting country. The best months are March, April, and May, when it is very dry; after that it becomes extremely hot, the rainy season lasting from July till October.

The following extracts are from a letter published in *The Field* of June 25, 1898, relating to game in the Gold Coast hinterland:—

“From Cape Coast to Kumasi there is no animal life. A small Sloth¹ screams all night, but the only

¹ Either one of the two species of Potto (*Perodicticus*) or one of the Galagos, both of which are members of the Lemur tribe, although almost invariably miscalled Sloths by sportsmen.

animals I saw were a young Bushbuck, very dark brown, and apparently the South African species, and a little beast of the Weasel tribe; there are very few Birds, but the Butterflies are numerous and gorgeous. North of Kumasi a few Francolin venture out of the bush. The country round Gambaga is wooded, trees small but thick in places, patches of long grass, but it is nearly all burnt off; there are at least five sorts of small Buck, mostly very wild; the most common is a gray Oribi.

"There are three sorts of Francolin here, the largest being very like the South African Graywing, but rather larger, about the size of a Grouse; it is called Bushfowl, locally. This Bushfowl is common, and first-class eating. The next is a bird the size of an English Partridge; it is by no means common, and I have not seen it in any other part of Africa; its general colour is yellow. The smallest of the three is common on the coast; it is dark brown with red legs and beak, and a yellow horse-shoe on the breast; its chief peculiarity is that the tail is carried up like a Bantam's. It is partial to rocky ground, and has a most melodious whistle. The large green Pigeon with yellow breast is common, also a Rock Pigeon."

The next district in West Africa where sportsmen can penetrate far into the interior is the Niger valley. The following extracts with regard to sport in this region are taken from a letter by Capt. B. R. M. Glossop published in *The Field* of Sept. 24, 1898. Soon after starting up the river large schools of Hippopotami were met with. A halt was made at Lokoja, where, although game was abundant, shooting was difficult owing to the density of the forest.

Hartebeest (*Bubalis major*), Wart-Hog, Baboons, and numerous small Antelope were among the game seen. A female of the western form of the Roan Antelope was bagged. From Lokoja the writer travelled *via* Jebba to Fort Goldie, and thence to Borgasi, near Kiama, in Borgu. After leaving the Niger he journeyed for some fifty miles through an uninhabited district. Tracks of game were abundant, and included these of Elephant, Lion, Roan Antelope, Western Hartebeest, Leopard, and various small Antelopes. The "bag" included Roan Antelope, Hartebeest, Duiker, and Oribi. The Borgus themselves do a good deal of hunting, using poisoned arrows, but never employing dogs. It may be added that Giraffes, regarded as representing a distinct variety of the northern form, occur in certain districts of Upper Nigeria. The Western Sing-sing Waterbuck is doubtless also to be met with. And in parts of the district Major Arnold has obtained the Dwarf Red Buffalo (*Bos caffer nanus*), which extends as far south as the Congo valley.

From Liberia to the Congo, or what may be called the typical West African region, there occur a number of animals unknown elsewhere; many of them having but a small geographical distribution, and several having never yet been killed by Europeans. Foremost of these is the Gorilla (*Anthropopithecus gorilla*), which is confined to the coast districts in the neighbourhood of the Gaboon and Cameruns. Here also is found the Chimpanzee (*A. troglodytes*), although its range also extends eastwards far into the heart of the continent. Those ugly Baboons (*Papio*) known as the Mandrill and Drill are likewise from the West Coast; as are two species of Potto (*Perodicticus*) already mentioned.

The Scale-tailed Squirrels, either with a parachute (*Anomalurus* and *Idiurus*), or unprovided with the same (*Zenkerella*), are also found here. The peculiar otter-like *Potamogale* frequents the river-banks of this region. The Pigmy Hippopotamus (*H. liberiensis*) wanders in the marshy forests of Liberia; while the Red River-Hog (*Sus porcus*) has a wider range. The finest of all is the Bongo (*Tragelaphus euryceros*), the largest of the Harnessed Antelopes; its habitat is the Ashkankolo Mountains. Other peculiar Antelopes are the West African Situtunga (*T. gratus*), from the Gaboon; and the beautiful Banded Duiker (*Cephalophus dorice*), from Fanti and the neighbouring districts. The Yellow-backed (*C. sylvicultor*) and Jentink's Duiker (*C. jentinki*), which approach a donkey in size, are likewise West African. Here too occurs the remarkable Water-Chevrotain (*Dorcatherium aquaticum*), the only living representative of its kind. Monkeys of many descriptions abound in the forests, one of the most striking being the Woolly Guereza (*Colobus vellerosus*), which now stands in danger of extermination on the Gold Coast, owing to the commercial value of its long silky fur.

To mention birds in any detail is absolutely forbidden by lack of space. It may, however, be observed that the beautiful Pheasant Turacos, such as *Turacus buffoni*, are characteristically West African, as is the magnificent Violet Plaintain-Cutter (*Musophaga violacea*), which may be found perched on the highest trees of the Gold Coast. Two species of Guinea-fowl, namely, the Black Guinea-fowl (*Phasidus niger*) and the Turkey Guinea-fowl (*Agelastes meleagrides*), are likewise inhabitants of this region. The two kinds of Gray Parrot are West African birds, although the

common *Psittacus erythacus* ranges eastwards into the heart of the continent.

Although abundant sport is attainable on the Congo, Elephants still occurring in large herds in many districts, the country being under foreign dominion renders it less easy of access to British sportsmen than would otherwise be the case. In the Portuguese territory of Angola, Mr. G. W. Penrice, starting from Benguela, has of late years made some very successful sporting trips. His bag included Cape Buffalo, Roan Antelope, Greater Kudu, the Angolan Sing-sing Waterbuck (*Cobus defassa penricei*), Springbuck, and many of the smaller Antelopes. Several of these animals, it will be noticed, are identical with South African species; and indeed when the southern provinces of Angola are reached, the fauna is practically the same as that of the districts still farther south. In thus passing gradually into the Cape fauna I have completed my brief survey of the chief African hunting fields.

MADAGASCAR.—Although, from the total absence of large game of all descriptions, the great island of Madagascar can scarcely claim to be regarded as a hunting field in the proper sense of the word, yet its animals are so peculiar, and so unlike those of the rest of the world, that they can scarcely be passed over without a brief reference. Curiously enough, all the larger mammals so characteristic of Africa are conspicuous by their absence; the only exception being a species of Bush-Pig (*Sus edwardsi*), which has evidently swum the intervening channel at no very distant date. The largest Carnivore is the Fossa (*Cryptoprocta ferox*), a creature serving in some degree to connect the Civets with the Cats; and there are

several peculiar kinds of the Mongoose tribe. But the essential peculiarity of the mammalian fauna of the island is the extraordinary development of Lemurs, most of which are quite different from those of Africa. The largest are the Sifakas (*Propithecus*) and Indri (*Indris*); the former being very numerous in species and long-tailed, whereas the single representative of the latter is a short-tailed animal. They are further remarkable for the large amount of white which enters into their coloration, and the general brightness of their tints. In many parts of the island almost every copse holds a Sifaka; and in the evening they may be seen in numbers passing from one patch of cover to another. The Ring-tailed Lemur (*Lemur catta*) frequents rocky districts; but the other true Lemurs, of which there are many, are forest-dwelling creatures like the Sifakas. Still more remarkable is the Aye-aye (*Chiromys madagascariensis*), a long-haired, brush-tailed Lemur, with curiously slender fingers (one especially so) and toes, and front teeth like those of Rodent. Although of small bodily size, reference must likewise be made to the peculiar Tenrecs (*Centetidae*), which are restricted to the island, and some of which resemble miniature Hedgehogs in general appearance.

GREENLAND AND ARCTIC AMERICA.—With Alaska, the northern districts and islands of the Dominion of Canada, and Greenland, I commence a survey of the hunting grounds and game of the New World. It must be mentioned, however, that the area is so great and the number of mammals and birds so large, that only a very brief and cursory notice can be attempted. In Arctic America and the northern portion of the territories to the southward a con-

siderable number of the animals are more or less closely allied to those of Northern Asia and Europe; but as the traveller proceeds farther south he will notice a gradual disappearance of Old World types, until in Central and South America he meets with a fauna quite unlike that of any other part of the world.

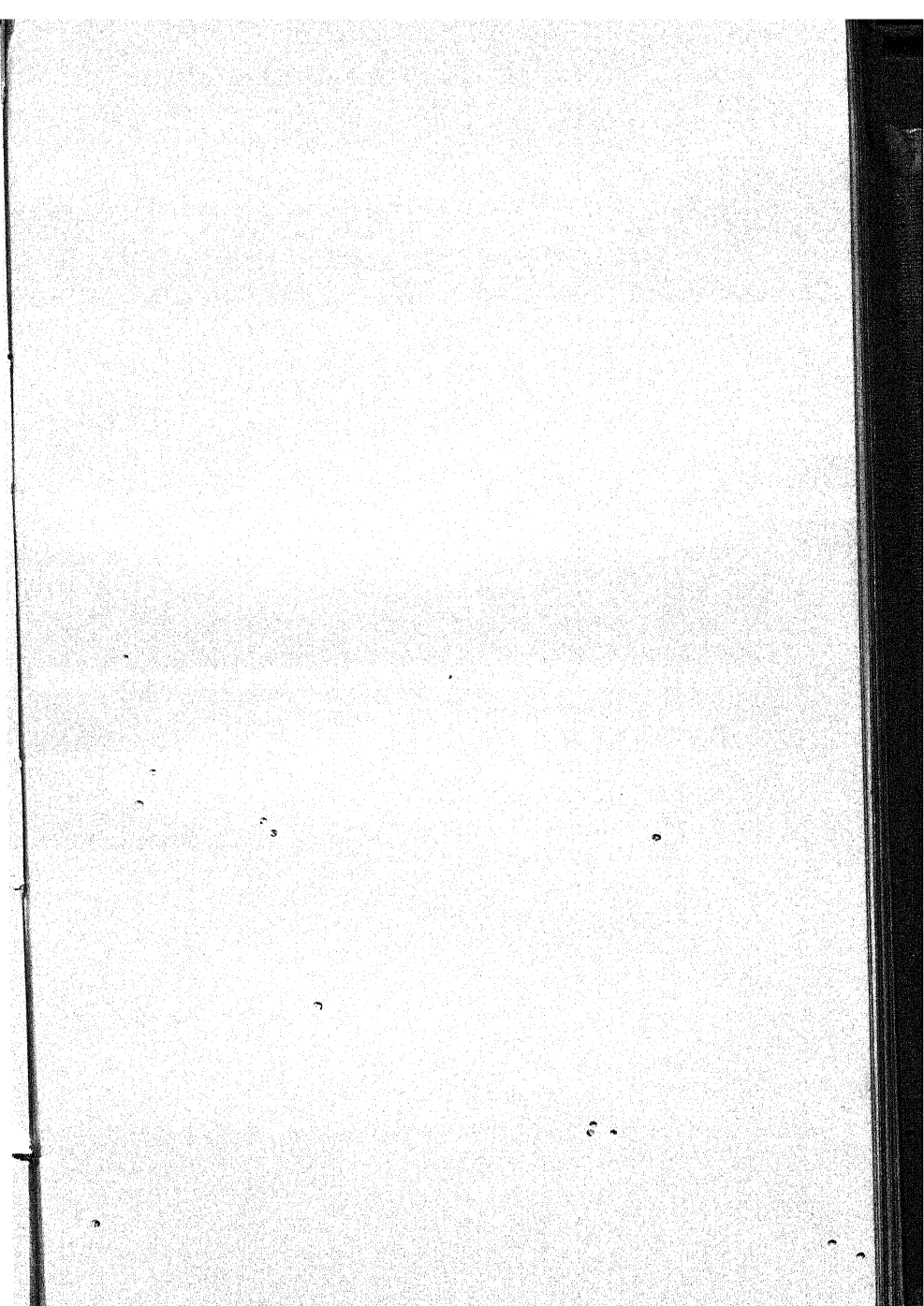
Among the strictly Arctic mammals of the Western Hemisphere, the Polar Bear and the Arctic Fox are severally identical with their Old World representatives. Seals of various kinds, among which may be mentioned the Greenland species (*Phoca groenlandica*), as well as Cetaceans, for the most part identical with Eastern species, abound in these seas. Certain islands in Bering Sea are the home of Fur-Seals, or Sea-Bears, as well as of Sea-Lions and Sea-Otters; but since the killing of these is under special regulations, and the right leased to a company, they are of no interest to the sportsman. The Pacific Walrus (*Odobæenus obesus*), which has considerably finer tusks than its Atlantic relative, is, however, obtainable on the northern coasts of the Pacific. The most remarkable large game animal of the Arctic districts of the Western Hemisphere is, however, undoubtedly the Musk-Ox (*Oribos moschatus*), of which fine examples were obtained by the Earl of Lonsdale during his adventurous journey of 1888-89. The range of this animal extends from the shores of the Arctic Ocean to about the 60th parallel; but it does not appear to occur to the westward of the Mackenzie River, and is not known to exist in Alaska; its southern extension seems to be gradually contracting. Northwards and eastwards it extends through Parry Islands and Grinnell-land to North

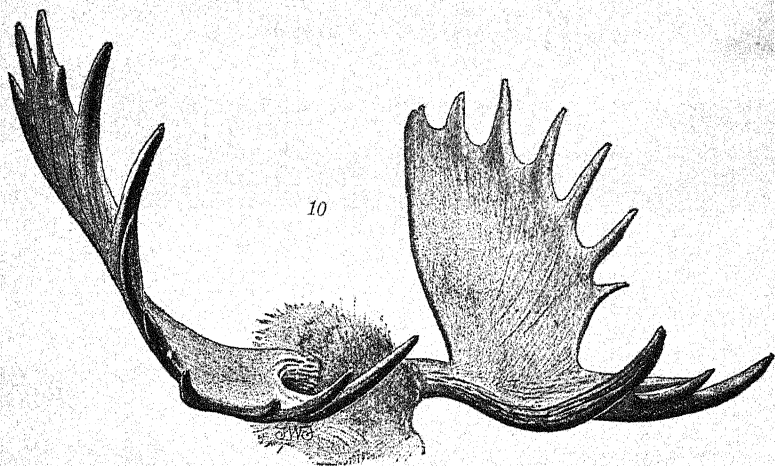
Greenland, reaching on the west coast as far south as Melville Bay, and having been also met with at Sabine Island on the east coast. A little to the eastward of the Peace River Musk-Oxen were recently very numerous, and many were killed by hunters. The Barren-Ground race of the Reindeer or Caribou (*Rangifer tarandus arcticus*) ranges from the shores of the Arctic Ocean to the northern limit of forests; and is represented by a closely allied race in Greenland (*R. t. groenlandicus*). The larger and darker Woodland Reindeer, to be again mentioned below, ranges in Alaska as far north as the wooded districts of the Upper Yukon. It appears that the Barren-Ground Caribou was once exceedingly numerous on the tundras of Alaska; but even as early as 1877 it had become very scarce on the coasts of Bering Strait, and since that date its numbers have been much diminished in the interior. The Alaskan Elk, or Moose, which inhabits the same ground as the Woodland Reindeer, is so much larger than the animals found farther south, that it has been separated by the American naturalists as a distinct species; and it may possibly be entitled to rank as a separate race. Very characteristic of the country is the Alaskan Big-horn (*Ovis canadensis dalli*), which in winter at least is pure white; and whose horns and ears are intermediate in character between those of the Kamschatkan and Rocky Mountain Big-horns. Two huge Brown Bears are found in Alaska, one (*Ursus arctus dalli*) inhabiting the mainland, while the second and still larger race is restricted to Kadiak Island, on the south coast. A mounted example of the former may be seen in the Natural History Museum. The Barren-Ground Bear (*U. a.*

richardsoni), nearly allied to the Grizzly, is found between Hudson Bay and the Mackenzie.

As most of the other species of mammals inhabiting Arctic America are also found in the districts farther south, they may more conveniently be noticed below. It may be mentioned, however, that during the spring and summer months the otherwise desolate tundras of Alaska teem with bird-life. At this season are to be seen the Canada Goose (*Branta canadensis*), the White-fronted Goose (*Anser hyperboreus*), and the Snow Goose (*Chen hyperboreus*), together with Swans and numerous species of fresh-water Ducks. The handsome Harlequin Duck (*Harelda glacialis*) is to be met with on the smaller tributaries of the Yukon; and in addition to all these, Sand-hill Cranes and various kinds of wading birds abound. On the coast of Bering Sea the gunner may bag four species of Eider-duck (*Somateria*), including the Spectacled, King, and Steller's Eider. Here, too, may be found the handsome Emperor Goose (*Philacte canagica*), which is a species peculiar to North America. The Black Brent Geese (*Branta nigricans*) are reported to pass in huge flocks every spring along the shores of Bering Sea, affording magnificent sport to the gunner while the flight lasts. During their sojourn in Alaska the Ducks get excessively fat and remarkably well flavoured from feeding on a kind of blueberry which grows abundantly on the bare coast-hills. Two kinds of Ptarmigan are common on the mainland, one of which collects in large packs during the winter.

SOUTHERN CANADA, UNITED STATES, AND MEXICO.—To the southward of the limit of the range of the Musk-Ox we enter the region containing what may

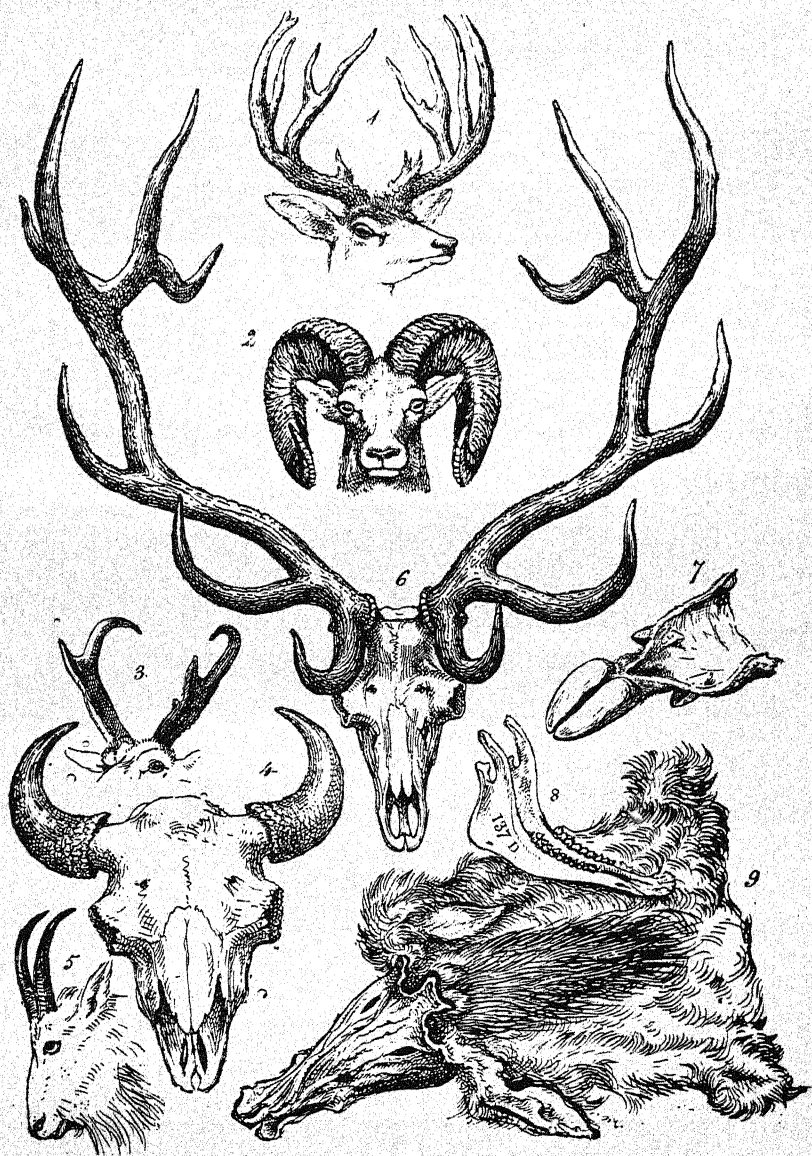


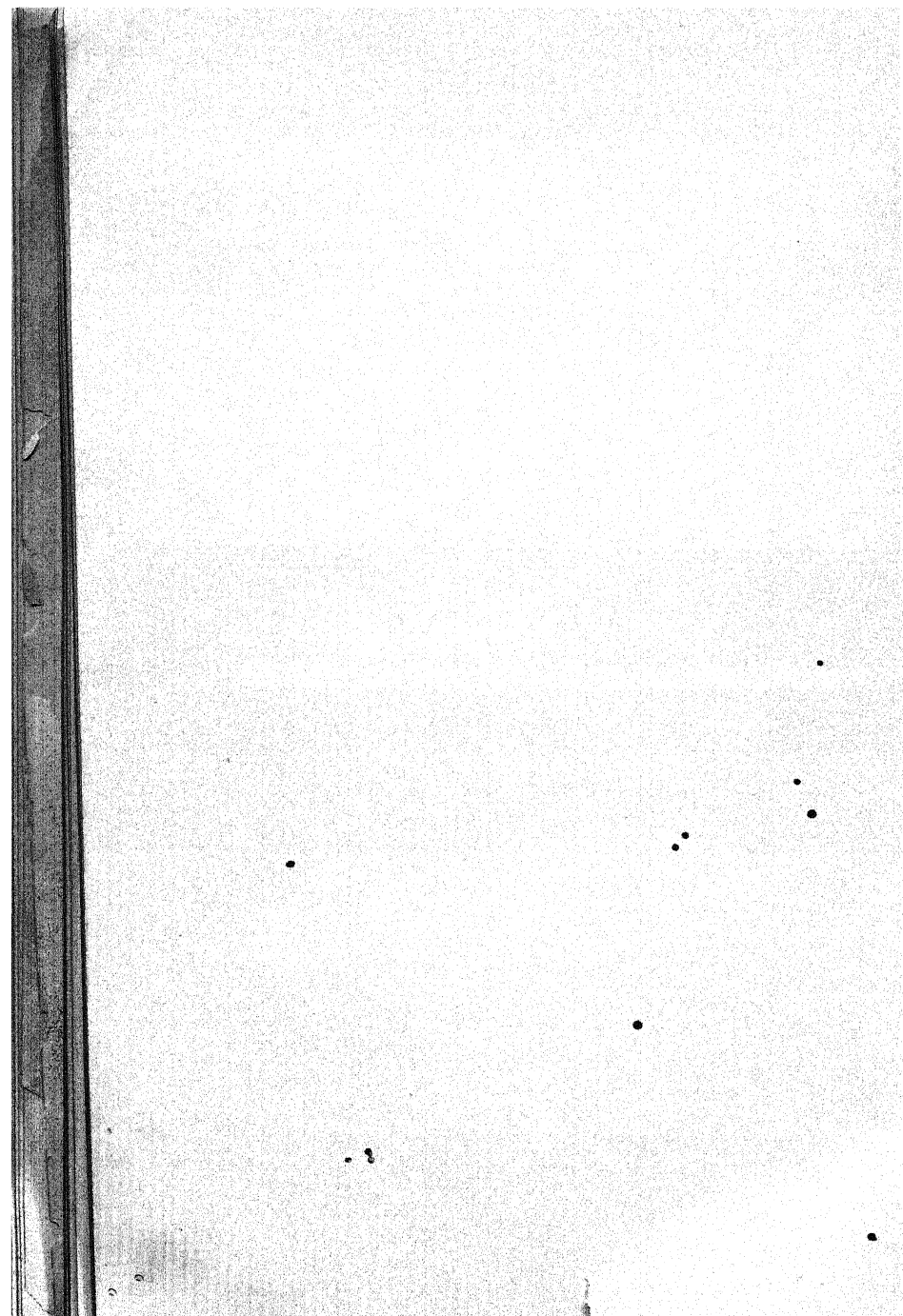


NORTH AMERICA

1. Black-tailed Deer. *Mazama columbiana*.
2. Big-horn, or Rocky Mountain Sheep. *Ovis canadensis*.
3. Prong-Buck. *Antilocapra americana*.
4. Bison (Buffalo). *Bos americanus*.
5. Rocky Mountain Goat (*Haploceros montanus*).
6. Wapiti. *Cervus canadensis*.
7. Deer Slot—to show skinning.
8. Wapiti—lower jaw.
9. Scalp of Wapiti, as saved on the field.
10. Antlers of male Elk.

* * For Measurements of Horns, Weights of Big Game, and other Statistical Information, see *Records of Big Game*, by Rowland Ward, F.Z.S. One vol. Illustrated. Price 30s. net.





be regarded as the typical fauna of North America, which continues approximately as far south as lower Mexico. The chain of the "Rockies" forms a very important feature in this area, enabling northern types of animals to range much farther south than would be the case were this elevated tract non-existent. Throughout a large part of Canada and the United States the progress of those influences which tend to disturb great game, and to restrict their range, has been more rapid during the last quarter of a century than in almost any part of the world; one of the results being the practical extermination of the American Bison.

The American Bison (*Bos bison*), miscalled Buffalo, has practically ceased to be an animal of sport; but reports vary considerably as to the approximate numbers which still survive. There are two varieties, the Woodland race (*B. bison athabascæ*), and the Prairie race (*B. bison typicus*). Some of the former remain in the neighbourhood of the Peace River in Canada, where Lord Lonsdale obtained his specimens in 1888, and Mr. Warburton Pike came across a few bands in 1890. A herd is preserved in the Yellowstone Park, and, as noticed above, a few survive in Idaho, and probably also in Colorado, Texas, etc. Of the other Hollow-horned Ruminants, the finest is the Rocky Mountain Sheep or Big-horn (*Ovis canadensis*), of which the typical race inhabits the mountains from which it takes its name. In addition to the Alaskan race already noticed, there are other local races, namely, the North-western race (*Ovis canadensis stoneri*) from the upper part of the Stikin (Stickeen) River, at no very great distance from the Alaskan frontier; the Liard River race (*O. c. liardensis*), which occurs farther

eastward, on the above-named tributary of the Mackenzie; and, finally, the Southern race (*O. c. nelsoni*), from the Grapevine Mountains between California and Nevada, and some of the neighbouring districts. Large horns of Big-horn are now very difficult to obtain; British Columbia being one of the best districts in which to procure this fine Sheep.

One of the most characteristic of North American animals is the so-called Rocky Mountain Goat (*Haploceros montanus*), distinguished by its pure white shaggy winter coat, and tapering cylindrical black horns. It is not really a true Goat, but more nearly allied to the Serows of Asia. The best localities for this ruminant are in British Columbia, but it probably extends northwards into Alaska.

For Elk, or Moose (*Alces malchis*), the best grounds are in Canada, especially in Nova Scotia, New Brunswick, and the district to the south of James Bay towards Lake Winnipeg. The range of the Woodland Reindeer, or Caribou (*Rangifer tarandus caribou*), extends from the limit of forests southwards to Nova Scotia, New Brunswick, Northern Maine, and Lower Canada on both sides of the St. Lawrence, thence passing westwards through the district north of Quebec to the neighbourhood of Lake Superior, south of which the species is unknown. The only true Deer found in the New World, where there are two local races, is the Wapiti (*Cervus canadensis*), which is almost invariably miscalled Elk on the other side of the Atlantic. The Eastern or typical race (*C. canadensis typicus*) ranges on the east side of the Rockies from about lat. 57° to Wyoming and Montana, but has been exterminated from many districts where it was formerly common. On the other hand, the Western race (*C. c. occidentalis*)

is found on the Pacific side of the Rockies from British Columbia and Vancouver Island to the north of California and New Mexico; and in parts of Wyoming, especially in the famous Jackson's Hole district. In the autumn of 1896 it was estimated that some 25,000 head of this splendid Deer came down from the mountains to winter in the district south of the Yellowstone Park. Unfortunately, about 80 per cent of the fawns and 10 per cent of the adults perished from the inclemency of the season. Wapiti-shooting in these districts closes on December 1. The other Deer belong to the exclusively American genus *Mazama*. Foremost among these is the widely spread Common American Deer (*Mazama americana*), of which the typical Virginian race, ranging over Eastern North America from Maine to the Gulf of Mexico, is the most familiar. In the Western States it is replaced by the so-called White-tailed Deer (*M. a. macrura*), while in Florida its place is taken by the small *M. a. osceola*, and numerous other small forms occur in Mexico and Central America. Very distinct is the well-known Mule-Deer (*M. hemionus*), whose range embraces suitable districts to the westward of the Missouri, from British Columbia to Southern California. The allied but rather smaller Black-tailed Deer (*M. columbiana*), which also extends from British Columbia to California, but is confined to a narrow belt near the coast, is the only other Deer likely to interest the sportsman. In America the name "Antelope" is commonly applied to the very remarkable ruminant designated in Europe Prong-buck, or Prong-horn (*Antilocapra americana*), which belongs to a family by itself, and is characterised by its forked horn-sheaths, which are shed and replaced annually. Prong-buck are still numerous on the great

prairies that touch the Rocky Mountains, as well as in Sonora and North Mexico, while they also extend northwards to the confines of Canada. Their proper home is, however, Sonora and Arizona, and they belong to a fauna somewhat different from that of the Northern United States.

Of the North American Carnivora, exclusive of those mentioned under the heading of Arctic America, p. 205, the most formidable is the Grizzly Bear (*Ursus arctus horribilis*), the typical form of which ranges from Norton Sound, Alaska, through the Rockies to Utah; the Sonoran Grizzly, of Mexico and California, being regarded by some writers as distinct. The so-called Cinnamon Bear seems to be a colour-phase of the Grizzly. The American Black Bear (*U. americanus*), which has a wide geographical range, is, however, a perfectly distinct species. The North American Wolf (*Canis lupus nubilus*) has also a wide range, and mention may be made of the American varieties of the Common Fox, respectively known as the Cross Fox, and the Silver, or Black Fox, the fur of the latter being highly valued. Among the Cat tribe, the Puma (*Felis concolor*), commonly known as "the "Lion," "Panther," or "Painter," is to be met with in most parts of the United States, although more numerous in some districts than in others. A correspondent writing from Uinta County, Wyoming, says that in that State, as well as in Colorado and Utah, Puma are very plentiful. They must be hunted with hounds, and can only be obtained with certainty during the early spring and late autumn. Three a week is a fair average for a pack during the season, but sometimes three or four may be killed in a single day. There is also the Canada Lynx (*Felis lynx canadensis*),

from the wooded districts, replaced farther south by the Bay Lynx (*F. l. rufa*), and in Colorado, Utah, and Arizona by the Plateau Lynx (*F. l. baileyi*).

Fur-bearing animals of the Weasel tribe are exceedingly numerous in the more northern districts of America. Firstly, we have the Glutton, or Wolverine (*Gulo luscus*), from the wooded districts of Canada, an animal not separable from the European species. The Martens are represented by *Mustela americana*, nearly allied to the Pine-Marten of Europe; but the Fisher-Marten (*M. pennanti*), ranging from Alaska to Texas, is very distinct. Among smaller forms may be mentioned the Black-footed Polecat (*M. nigripes*), and the American Ermine (*M. erminea richardsoni*). The well-known Skunks (*Mephitis* and *Spilogale*) are characteristic American animals with beautiful fur, and mention must likewise be made of the American Badger (*Taxidea americana*), whose pelage is likewise of considerable value. Another valuable fur-bearer is the American Otter (*Lutra canadensis*); while the Raccoons (*Procyon*) and Coon-mistles (*Bassariscus*) are among the most characteristic of American fur-producers, easily recognised by the alternate dark and light rings on their tails. My list of North American mammals of sport closes with the Canadian Beaver (*Castor fiber canadensis*), but the true Opossum (*Didelphys marsupialis*) cannot be passed over without mention.

Game-birds and Water-fowl are so numerous in North America, that it is quite impossible to mention them all. In regard to the Ducks and Geese, etc., Dr. D. G. Elliot writes that "North America at one time probably contained more wild-fowl than any other country of the globe, and even in the recollection of

some living the birds came down from the northland during the autumn in numbers that were incredible, promising a continuance of the race for ever. I have myself seen great masses of Ducks, and also of Geese, rise at one time from the water in so dense a cloud as to obscure the sky, and every suitable water-covered spot held some member of the family throughout our limits. But those great armies of wild-fowl will be seen no more in our land, only the survivors of their broken ranks." The names of a few of the more northern species have been already mentioned under the heading of Arctic America, and it must suffice to add that Dr. Elliot recognises a total of 63 species and races, among which several, such as the Wild Duck and the Gadwal, are identical with European forms. Of these, the most celebrated from a gastronomic point of view is the Canvas-back (*Aristonetta valisneria*), while the largest is the Trumpeter Swan (*Cygnus buccinator*).

Turning to Game-birds and Snipe, the three most important in the Eastern United States are the Ruffed Grouse (*Bonasa umbellus*), the Virginian Quail, or "Bob White" (*Ortyx virginiana*), and the American Woodcock (*Scolopax minor*). The list also includes the Canada Grouse (*Canachites canadensis*), which ranges as far south as New York, Franklin's Grouse (*C. franklini*), from the west of the Rockies, the two species of American Capercaillie (*Dendragapus*), the Prairie Hens (*Tympanuchus*) and Sage Grouse (*Centrocercus*), the two species of Sharp-tailed Grouse (*Pedioceles*) and the Hazel Hens (*Tetrastes*). As the Guinea-fowls are exclusively African, so the Turkeys are characteristically American in the wild state; of these the Common Turkey (*Meleagris gallopavo*) comes

from the table-lands of Northern Mexico and the neighbouring States, while in the Eastern States it is replaced by *M. americana*. By far the most beautiful species is, however, the Central American *M. ocellata*, from Guatemala, Yucatan, and British Honduras. There are also numerous relatives of the "Bob White," such as the Scaled Partridges (*Callipepla*), the Mountain Partridge (*Oreortyx pictus*) from the Western States, the Californian Quail (*Lophortyx californicus*), and the species of *Cyrtonyx*, which extend from the South-western States into Central America. It may be added that Pheasants have been introduced and acclimatised into several of the States, but in some at least, as in New York, they are still absolutely protected. The Snipe are represented by Wilson's Snipe (*Galinago wilsoni*).

Of other birds, it may be mentioned that the Red Flamingo (*Phoenicopterus chilensis*), a species by no means so well coloured as its European relative, occurs in the warmer States. Among the diurnal Birds of Prey are to be found the Osprey (*Pandion haliaëtus*), the Golden Eagle (*Aquila chrysaëtus*), and the White-headed Sea-Eagle (*Haliaëtus leucocephalus*), while the Harpy Eagle is to be met with in the dense forests of Mexico, where, as well as in some of the southern United States, the handsome Ivory-billed Woodpecker is to be obtained. The American Vultures constitute a family (*Cathartidae*) quite distinct from the one in which the Old World Vultures are grouped; and representatives of the South and Central American group of Humming-birds extend as far north as the Southern States of North America.

Mention has already been made of the abundance of Salmon and Trout in the streams and lakes of

Arctic America, and the same holds good for many of those of the districts now under consideration. Wonderful sport is, indeed, afforded in many districts of North America to the angler, but it is not necessary here to particularise the various species obtainable. Attention may, however, well be directed to a description of angling that has of late years been practised with startling results, at least for Europeans. This is the capture on the west coast of Florida of the Tarpon, or King Herring (*Megalops thrissoides*). As this fish may weigh as much as a couple of hundred pounds, and measure about twelve feet in total length, its capture with the rod and line affords excellent and exciting sport, demanding the utmost skill of the angler; the behaviour of these monsters when hooked being most game. The angling is from a boat, the struggle will often last four or five hours, and the reel-work is tremendous. For an account of Tarpon-fishing see *The English Angler in Florida*, by Rowland Ward.

CENTRAL AND SOUTH AMERICA.—Although America from the south of Brazil to Cape Horn contains only a comparatively small number of animals coming under the designation of big game, yet it is a country of overwhelming interest to the naturalist, the greater number of its mammals and birds being quite unlike those of any other region. The area includes a great variety of climate, the Guianas and Brazil including some of the hottest countries in the world, whereas for the greater part of the year the climate of the Argentine is delightful, while Patagonia in winter is very cold indeed. For a yachting voyage, so arranged that excursions can be made inland from different ports, this part of the world presents exceptional advantages. In the forests of Brazil and the neigh-

bouring countries dogs are necessary for the larger game; and, indeed, the ordinary traveller through the primeval forest scarcely ever encounters the bigger animals haphazard. Men are sent into the forest with dogs; they find an animal which almost invariably takes to the nearest river, where the sportsman is in waiting, and gets his shot as the creature swims. Peccary, however, do not take to the water, and are followed till brought to bay by the dogs. On the other hand, in the open plains of the Argentine, as well as in Patagonia, all shooting is invariably done on horseback, the horses being so trained as to stand immovable while the sportsman dismounts for his shot.

Of the Carnivora, the Puma, of which there are several local races, ranges throughout the area, being especially numerous in parts of Patagonia; the gray variety is never found north of the Isthmus of Darien. The Jaguar, the *Tigrè* of the Spanish colonists (*Felis onca*), is also widely distributed, being very abundant in Paraguay and the Matto Grosso district of Brazil, where remarkably fine specimens are met with; black Jaguars are, by no means uncommon. Of the smaller Cats, the Ocelot (*F. pardalis*) displays an extraordinary degree of variation in its handsome colouring; there is also the curious, uniformly coloured Jaguarondi (*F. jaguarondi*), and farther south the long-haired Pampas Cat (*F. pajeros*). The so-called Red Wolf (*Canis jubatus*) is a large and peculiar wild Dog ranging from Brazil to Argentina; and there are numerous smaller species commonly called Foxes, such as *C. azaræ*, *C. cancrivorus*, etc., while in the Falkland Islands there is a true Wolf (*C. antarcticus*). One of the rarest of all animals in collections is the Bush-Dog (*Speothos*

venaticus), of the Guianas and Brazil. Only one Bear—the Spectacled Bear (*Ursus ornatus*) of the Chilian Andes—is found throughout the area; but smaller Carnivora are abundant. Among these, the Brazilian Otter (*Lutra brasiliensis*) is the largest of its tribe, while the Grison and Tayra (*Galictis* and *Galera*) are peculiar South American types. The South American Skunks (*Conepatus*) are likewise markedly different from their northern relatives; and the Coatis (*Nasua*) are restricted to this area.

The forests of Guiana and Brazil abound with Monkeys—among which the Spider-Monkeys (*Ateles*) are some of the most familiar—all very widely distinguished from their relatives of the Old World. But the most remarkable of all South American mammals are undoubtedly the Sloths (*Bradypus* and *Choloepus*), the Ant-eaters (*Myrmecophaga*, *Tamandua*, and *Cyclopes*), and the Armadillos (*Dasypus*, *Tatusia*, *Priodon*, etc.), the two former being confined to the hot forest districts, while the latter (which people will persist in regarding as reptiles) are met with everywhere. The Rodents, or Gnawing Mammals, likewise present numerous peculiar types, the Carpincho, or Capibara (*Hydrochaerus capibara*), of the rivers of Brazil and Uruguay, being the largest member of the entire group. The Coypu, or Nutria (*Myopotamus coypus*), is another aquatic type with a wider range. In the warmer forests we find Agutis (*Dasyprocta*) and Pacas (*Cælogenys*), while the valuable Chinchillas (*Chinchilla* and *Lagidium*) are confined to the higher Andes. The Tree-Porcupines (*Syntheres*) form a peculiar South American group confined to the forest districts. And on the Argentine Pampa the warrens of the Viscacha (*Lagostomus trichodactylus*) form con-

spicuous objects; while in South Argentina and Patagonia the Mara, or Patagonian Cavy (*Dolichotis patagonica*), may almost be regarded as a feature in the landscape.

But a greater attraction to the sportsman is afforded by the numerous species of Deer peculiar to Central and South America. These include several small races of the Common American Deer (*Mazama americana*), ranging from Southern Mexico to Peru; the handsome red and black Marsh-Deer (*M. dichotoma*) of Brazil, Paraguay, and Northern Argentina, and the smaller but allied Pampas Deer (*M. bezoartica*) of the Argentine: the two species of Guemal (*M. antisiensis* and *M. bisulca*) from the Andes and Patagonia; the numerous small species of Browsers (*M. nemorivaga*, *rufa*, etc.), ranging from Central America to Paraguay; and the two Pudus (*Pudu*) of the Andes, which are the smallest of all Deer. The Guanaco (*Lama guanacus*) and the Vicugna (*L. vicugna*), the wild representatives of the Alpaca and Llama, are peculiar South American ruminants, ranging from the high Andes of Peru and Bolivia to Patagonia, and in the latter country affording good sport with hounds. Lastly, we have the Tapirs, of which the common species (*Tapirus americanus*) is found in the forest districts of Brazil, etc., while others inhabit the mountains. Although of large size, these animals, from the absence of horns or tusks, afford no satisfactory trophies to the sportsman.

Among birds, the Rhea, or American Ostrich (*Rhea americana*), abounds on parts of the Argentine Pampas and in Patagonia, where it may be hunted with dogs, or taken by means of the bolas or lasso. Of the Birds of Prey, the largest is the Condor of the Andes (*Sarcorampus gryphus*), most abundant

in Bolivia, Peru, and Chili. Very characteristic of Central and South America are the peculiar Hawks known as Caracaras and Chimangos (*Polyborus* and *Ibycter*), of which there are numerous representatives in different parts of the country. The Red Flamingo may be met with from Brazil to the Argentine, while the great Jabiru stock (*Mycteria americana*) is generally distributed in the neighbourhood of lakes and swamps. Similar localities in the Guianas and Brazil form the haunts of that peculiar bird the Horned Screamer (*Palamedea cornuta*), its place being taken on the *lagunas* of Argentina by the Chaja, or Crested Screamer (*Chauna chavaria*). In winter the same lagunas abound with Duck of various descriptions; and on the pampas the different kinds of Tinamu, locally known as "Partridges" and "Pheasants," afford excellent sport with the shotgun, the largest species being the Martinetta, whose wailing whistle is a characteristic sound on the silent pampa.

Another remarkable South American bird is the large and long-legged Seriema (*Cariama cristata*), abundant on the plateaus of Brazil, but also found less commonly in Paraguay; and the Hoatzin (*Opisthocomus cristatus*), whose young climb by the aid of the claws on their wings, is perhaps even more noteworthy. Although also met with in the Southern United States, those great black Game-birds known as Guans and Curassows (*Gracidae*) attain their maximum development in the southern half of the New World. The lovely orange Cock-of-the-Rock (*Rupicola crocea*), formerly abundant in the Guianas, is one of the most gorgeous of all birds; while the Toucans (*Rhamphastidae*) attract attention

by their enormous and brilliantly coloured bills. Several species of the exquisite Manakins (*Pipra*), as well as the gorgeously coloured Fruit-eaters or Chatterers, are to be met with in the forests of Brazil and the Guianas. These last-named countries, together with the tropical districts generally, also form the true home of the great tribe of the incomparable Humming-birds (*Trochilidae*), which are most abundant about marshy deltas and the banks of rivers, although a few are restricted to the extinct volcanic craters of the high Andes. Finally, thousands of gorgeous Macaws (*Ara*, etc.), as well as various kinds of Paraquets, inhabit the teeming forests of Brazil and the Guianas, extending also into the warmer zones of the Andes.

It may be added that the Alligator of the Mississippi is replaced in the warmer rivers and lakes of South America by numerous species of the allied Saurians known as Caimans (*Caiman*), distinguished by the presence of bony plates on the under as well as on the upper surface of the body. These waters are also inhabited by shoals of fish, many of them of large size, but few satisfactory either for the sport they afford, or for the table. A large proportion of them belong, indeed, to the great family of Cat-Fishes (*Siluridae*), most of which are dangerous to handle on account of the wounds inflicted by the pungent spines on the back. Special mention must be made of the Arapaima (*A. gigas*), of the rivers of the Guianas and Brazil, on account of its being the largest of all fresh-water fish, specimens having been captured whose length reached fifteen feet, and their weight some 400 pounds.



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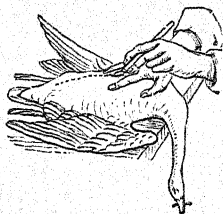
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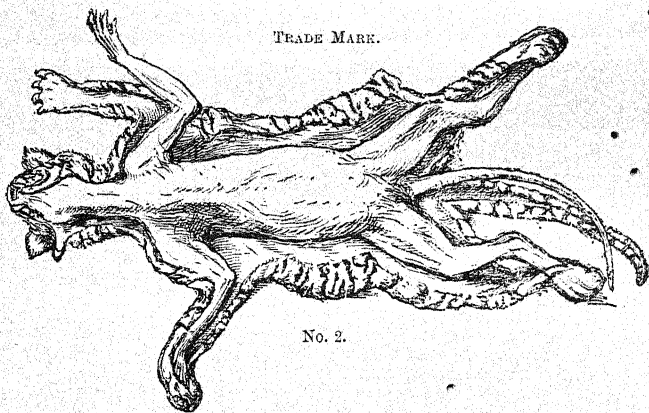
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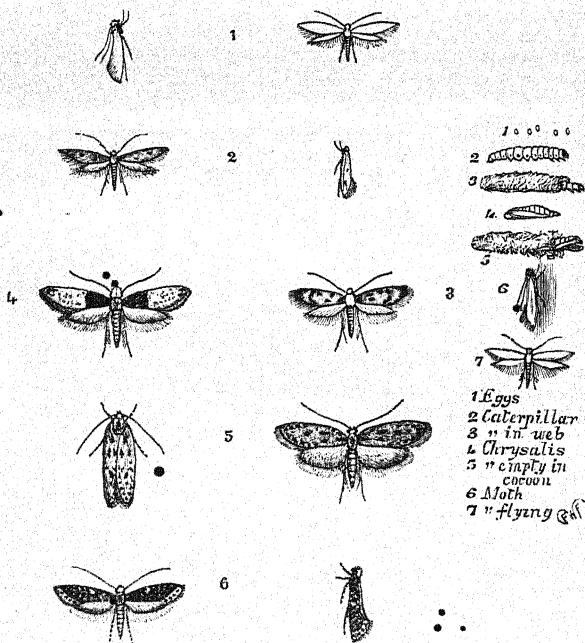
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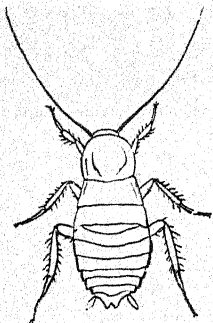
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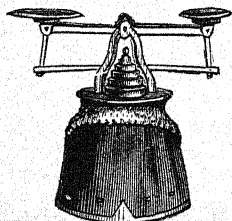


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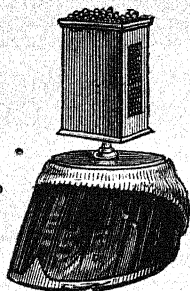
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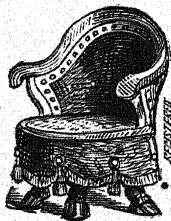


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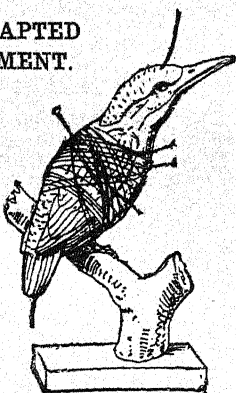
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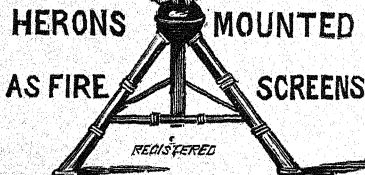
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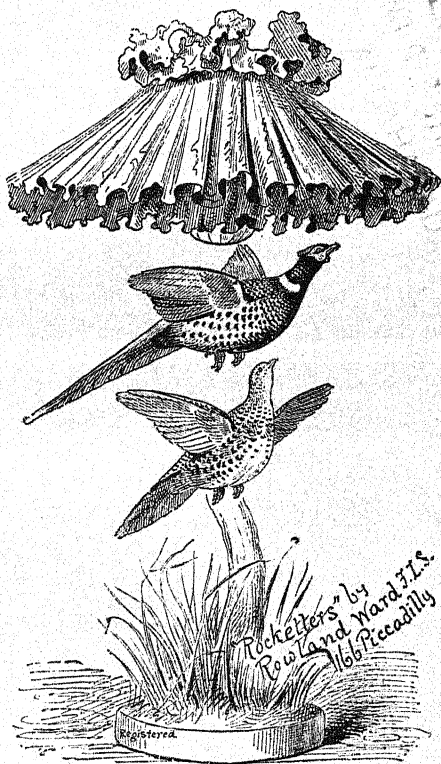
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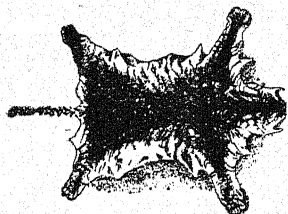
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